

II. *A Synopsis of British Homoptera-Cicadina.*  
Part II. By JAMES EDWARDS, F.E.S.

[Read October 5th, 1887.]

PLATE III.

XII. TETTIGONIDÆ.

Frons and clypeus very convex, the passage from the former to the crown widely rounded. Thighs with a pair of spines on the upper side at the apex.

The British species of this family constitute a well-marked group, combining the tumid frons of the *Cercopidæ* with the multispinose tibiæ of the *Acocephalidæ* and following families. The affinities of the group under consideration will be best appreciated on a comparison of the structure of the head in *Evacanthus* and *Philænus*; the structure of the frons and the ridge dividing the crown from the face is very similar in these genera, while the situation of the ocelli and the multispinose tibiæ of the former indicate an approach to *Acocephalus*. Our two genera may be thus distinguished:—

Frons longitudinally carinate .. ..	i. EVACANTHUS.
Frons non-carinate .. ..	ii. TETTIGONIA.

i. EVACANTHUS, *Lep. et Serv.* (Pl. III., fig. 1).

*Lep. et Serv.*, *Enc. Méth.*, x., 612 (1825).

Upper side pubescent. Ocelli just beyond the eyes three or four times as far from each other as from the sides of the crown. The latter with an anchor-shaped keel, crossed about its apical third by a more or less distinct straight ridge, which runs from one ocellus to the other; on each side at the base a callus or a short outwardly oblique keel. Scutellum with a transverse impressed line before the apex, and two punctures near the base. Submarginal wing-nerve reaching the costa.

The two species of this genus are distinguished as follows:—

Clavus deep black, its inner margin widely yellow    1. *interruptus*.  
 Clavus brown, with thick whitish nerves .. .. 2. *acuminatus*.

### 1. *Evacanthus interruptus*, L.

*Cicada interrupta*, Linn., Faun. Suec., ed. ii., 241, 889; Fall., Hem. Suec., ii., 28, 5; Zett., Ins. Lapp., 289, 2.

*Amblycephalus interruptus*, Curt., Brit. Ent., 572, 2.

*Evacanthus interruptus*, Burm., Handb., ii., 116, 2; Flor, Rhyn. Liv., ii., 149, 1; Marsh., Ent. Mo. Mag., ii., 84, 1; Kirschb., Cicad., 72, 1; J. Sahl., Not. Fenn., xii., 107, 1.

♂. Face yellow; frons with a series of fine curved brown transverse lines, interrupted down the middle by a wide stripe of the pale ground colour. Crown yellow, with some irregular symmetrical black markings, which have a strong tendency to spread over the entire surface. Pronotum transversely striate, black, with a large triangle in the middle of the hind margin, and the latter narrowly, yellow; or entirely black. Scutellum yellow, more or less widely black on the sides. Elytra yellow, a large spot occupying the apex and continued in an elongate triangular form as far as the middle, and an elongate triangular stripe occupying all but the inner margin of the clavus, deep black. Abdomen above black, sides widely and hind margins of the segments narrowly yellow. Legs yellow; hind tibiæ with black points at the roots of the larger spines.

♀. Similar to the male, but a trifle larger, and having the black markings somewhat reduced. Abdomen yellow, its sides widely black. Dimorphous. Length, 5—6½ mm.

Common and generally distributed.

### 2. *Evacanthus acuminatus*, Fab.

*Cicada acuminata*, Fab., Sys. Rhyn., 76, 68.

*C. interstincta*, Fall., Hem. Suec., ii., 29, 6.

*Tettigonia acuminata*, H.-Seff., Deut. Ins. iii., 9.

*Amblycephalus Germari*, Curt., Brit. Ent., 572.

*Evacanthus acuminatus*, Burm., Handb., ii., 116, 1; Flor, Rhyn. Liv., ii., 152, 2; Marsh., Ent. Mo. Mag., ii., 85, 2; Kirschb., Cicad., 73, 2; J. Sahl., Not. Fenn., xii., 108, 2.

♂. Frons dark brown or black, with a series of fine pale transverse lines; upper margin pale, at least in the middle; cheeks pale, more or less marked with dark brown or black. Crown black, sides irregularly pale. Pronotum and scutellum black, the hind margin of the former very narrowly pale. Elytra dirty yellowish, with the inner two-thirds of the clavus, an abbreviated band across the middle of the corium, and a large spot at the apex dark brown, the thick nerves and a large triangular spot on the apex of the costa whitish. Abdomen above blackish, pale in the middle behind. Legs dirty yellow, claws black. The dark markings on the elytra have a strong tendency either to coalesce or be reduced.

♀. Face as in the last species. Crown dark brown, its sides widely pale. Pronotum dirty yellow, the sides widely and a broad central stripe black; behind each eye there is frequently a short black line or a few black points. Scutellum black, sometimes indistinctly pale at the base. Otherwise coloured as in the male, but generally paler. Dimorphous. Length, 5—6 mm.

Common.

## ii. TETTIGONIA, Geoffr. (Pl. III., fig. 3).

Geoffr., Hist. abr. Ins., i., 429 (1762).

Upper side bare. Ocelli near the hind margin of the crown, the distance between each ocellus and the inner margin of the eye about twice as great as the distance between the ocellus and the hind margin of the crown. The frons encroaches on the horizontal upper surface of the head in the form of two wide arcuate lobes, separated from the crown proper by an impressed line, which is more distinct in the male than in the female. Submarginal wing-nerve running into the first nerve.

### 1. *Tettigonia viridis*, L.

*Cicada viridis*, Linn., Syst. Nat., v., 466, 46.

*Tettigonia viridis*, Germ., Mag. d'Ent., iv., 72, 25;  
Burm., Handb., ii., 118, 4; Flor. Rhyn. Liv., ii.,  
145, 1; Marsh., Ent. Mo. Mag., ii., 83, 1;  
Kirschb., Cicad., 72, 1; J. Sahl., Not. Fenn.,  
xii., 105, 1.

*T. arundinis*, Germ., l. c., 71, 24; Burm., l. c., 118, 5.

*Amblycephalus viridis*, Curt., Brit. Ent., 572, 1.

*Tettigonia flavicatella*, Herkl., Faun. Nederl., i., 183,  
132.

♂. Frons pale brown, the side margins, a stripe down the middle, and a series of fine curved transverse lines down each side, yellow; cheeks with a fine black line next the frons and clypeus. Crown greenish yellow, with a biarcuate line across the middle, and a pair of irregular pentagonal spots near the hind margin, black. Pronotum and scutellum yellowish green, the former sometimes irregularly marked with black in front, the latter with an abbreviated impressed transverse line near the base. Elytra subopaque, blackish blue, glaucous during life, membrane fumose. Abdomen above blue-black. Legs yellow, the claws and a fine stripe on the inner side of the hind tibiæ black, the spines of the latter springing from black points. Elytra sometimes green, with the nerves narrowly bordered with blackish.

♀. Elytra green, the costa narrowly whitish, nerves narrowly bordered with blackish. Length,  $5\frac{1}{2}$ —9 mm.

This exceedingly handsome insect is very abundant in damp grassy places. The var. *arundinis*, Germ., has the elytra pale, with the nerves widely margined with blackish.

### XIII. ACOCEPHALIDÆ.

Crown always distinctly separated from the face, generally by a well-defined ridge, its disc more or less excavated or bearing impressions, frequently transversely striate in front, at least distinctly sculptured. Ocelli on or adjoining the ridge which separates the crown from the face, or, if that is absent, on the forehead. Elytra generally coriaceous, with strongly-raised nerves; appendix wanting or very narrow.

The above definition of this family is the result of an endeavour to accomplish a convenient arrangement of the British genera included therein. In dealing with such limited material one has but little opportunity of giving due prominence to the natural affinities of the various genera, but it may be observed that *Strongylocephalus* and *Acocephalus* are very closely allied in such important points as the position of the ocelli and the structure of the wings and male genitalia. *Eupelix* combines with its own peculiar form the situation of the ocelli which obtains in the two genera last named, while the structure of its wings and male genitalia conforms to the type which is found in the genera which succeed it in the arrangement here adopted. This genus is regarded by Dr. J. Sahlberg, with considerable reason, as forming a separate group equivalent to the families

of the present work. *Platymetopius* and following genera, although sufficiently distinct from the *Jassidæ* by reason of the more elaborate structure of their head, are decidedly Jassid in their affinities, and might even be placed at the head of that family with propriety.

## TABLE OF GENERA.

- |    |   |                       |
|----|---|-----------------------|
| 1  | (6). Ocelli on the crown close to its front margin.   |                       |
| 2  | (5). Eyes normal.   |                       |
| 3  | (4). Crown transversely striate in front  | i. STRONGYLOCEPHALUS. |
| 4  | (3). Crown not transversely striate in front  | ii. ACOCEPHALUS.      |
| 5  | (2). Eyes nearly enclosed by the foliaceous edge of the crown .. ..                             | iii. EUPELIX.         |
| 6  | (1). Ocelli on the forehead.  |                       |
| 7  | (12). Crown not transversely striate in front.  |                       |
| 8  | (9). Crown angular in front .. ..   | iv. PLATYMETOPIUS.    |
| 9  | (8). Crown not angular in front.  |                       |
| 10 | (11). Pronotum separated from prosternum by a distinct ridge . . . .                            | v. GRAPHOCRÆRUS.      |
| 11 | (10). Pronotum not separated from prosternum by a ridge .. ..                                   | vi. DORATURA.         |
| 12 | (7). Crown transversely striate in front.   |                       |
| 13 | (14). Crown with a linear black band adjoining and running parallel with its front margin .. .. | vii. PARAMESUS.       |
| 14 | (13). Crown entirely pale .. ..   | viii. GLYPTOCEPHALUS. |

1. STRONGYLOCEPHALUS, *Flor.* (Pl. III., fig. 5).

*Flor*, Rhyn. Liv., ii., 109 (1861).

Crown obtusangularly produced and transversely striate in front; frons transversely impressed above; forehead thin and knife-like. Ocelli close to the front margin of the crown, about equidistant from the front margin and from the eyes. Elytra coriaceous, narrowly rounded at the apex, scantily pubescent along the nerves; two transverse nerves; appendix wanting. ♂: genital valve present; plates subnavicular; lower angle of pygofer with two unequal teeth, of which the front one springs from a wide base; free portion of the penis subcylindrical, bisinuate on the upper side, barbed at the apex (*agrestis*).

The two described European species are distinguished as follows:—

Length of pygofer (♂) down the middle of the upper side equal to or longer than the preceding dorsal segment. No black line on the crown in front .. 1. *agrestis*.

Length of pygofer ( $\sigma$ ) down the middle of the upper side distinctly shorter than the preceding dorsal segment. Front of crown with a black line just beyond the ocelli .. .. . 2. *Megerlei*.

### 1. *Strongylocephalus agrestis*, Fall.

*Cicada agrestis*, Fall., Hem. Suec., 36, 18.

*Strongylocephalus agrestis*, Flor, Rhyn. Liv., ii., 210, 6; Kirschb., Cicad., 74, 1; Scott, Ent. Mo. Mag., xi., 121, 1; J. Sahl., Not. Fenn., xii., 353, 1; Sign., Ess. Jass., 44, 1, pl. 2, fig. 18.

$\sigma$ . Frons black, finely and closely spotted with yellow-brown; remainder of the face and the upper side yellow-brown, finely and more or less closely speckled with dark brown or black. Crown transversely impressed, smooth at the base, transversely striate in front. Pronotum transversely striate, front margin widely smooth. Elytra a trifle longer than the abdomen, inner margin narrowly and some irregular spots along the costa and round the hind margin dark brown or black. Abdomen above black, beneath black irregularly spotted with yellow-brown towards the apex. Legs brownish yellow, the front pairs spotted and banded with black, the hind pair striped with dark brown or black.

$\varphi$ . Greyish yellow, with the dark markings very much reduced or entirely wanting; the narrow dark line on the inner margin of the elytra is the last to disappear. Hind margin of last ventral segment more or less concave, sometimes with an indication of a small notch in the middle. Length, 6—7 mm.

Marshes; not common. Chobham; near Norwich, &c.

### 2. *Strongylocephalus Megerlei*, Scott.

*Strongylocephalus Megerlei*, Scott, Ent. Mo. Mag., xi., 122, 2; Sign., Ess. Jass., 45, 2, pl. 2, fig. 19.

$\sigma$ . Frons black, its lower half speckled with yellow-brown; crown brownish yellow, with a black line along the front margin; otherwise similar to *agrestis*.

$\varphi$ . Frons yellow-brown, with a black line along its upper margin. Crown yellow-brown, with a black line along its front margin. This sex has a strong general resemblance to the male of *agrestis*, but it is much duller than that insect. Hind margin of the last ventral segment feebly concave, with a distinct notch in the middle. Length, 5—6 mm.

Marshes; hitherto rare. Northumberland (*Bold*); Ranworth, Surlingham, and Booton, Norfolk.

ii. ACOCEPHALUS, *Germ.* (Pl. III., fig. 6).

Germar, Silb. Rev., i., 181, 46 (1833).

Crown obtusangularly produced in front, more or less broadly excavated (in the subgenus *Anoscopus*, Kbm., slightly convex); in the male sometimes, and in the female generally, tricarinate. Ocelli on the front margin of the crown a little nearer to the eyes than to the apex. Submarginal wing-nerve incomplete. ♂: genital valve wanting; plates narrow, reflexed, connivent, sub-navicular; lower angle of pygofer with a blunt semicircular tooth; penis strap-shaped, barbed at the apex and in the middle (*albifrons*). Sexes very dissimilar.

## TABLE OF SPECIES.

- |    |   |                                    |
|----|---|------------------------------------|
| 1  | (6). Crown more or less broadly excavated.  |                                    |
| 2  | (5). Excavation of crown very strong.   |                                    |
| 3  | (4). Elytra not banded with white   | .. 1. <i>nervosus</i> .            |
| 4  | (3). Elytra with white bands. Crown one-third or more than one-third longer than pronotum .. .. . | .. 2. <i>bifasciatus</i> .         |
| 5  | (2). Excavation of crown very feeble. Crown not or very little longer than pronotum .. .. .       | .. 3. <i>albifrons</i> .           |
| 6  | (1). Crown slightly convex, not excavated.  |                                    |
| 7  | (8). Elytra dark brown, with broad white bands .. .. .  | .. 4. <i>brunneo-bifasciatus</i> . |
| 8  | (7). Markings of elytra longitudinal.   |                                    |
| 9  | (10). Elytra whitish hyaline, with the nerves and a band near the apex black ..                   | .. 5. <i>histrionicus</i> .        |
| 10 | (9). Nerves of elytra pale, interstices black   | 6. <i>flavostriatus</i> .          |

The foregoing table applies only to the males; the characters of the females will be found in the detailed descriptions which follow:—

1. *Acocephalus nervosus*, Schrank.

*Cicada nervosa*, Schr., Enum. Ins. Austr., 256, 481.

*Acocephalus cardui*, *obscurus*, *sparsus*, *unicolor*, *fasciatus*, *pallidus*, and *bicinctus*, Curt., Brit. Ent., 620, 1—8.

*Acocephalus adustus*, Hardy, Tr. Tyne. F. C., i., 429, 1.

*A. rusticus*, H.-Seff., Deuts. Ins., 124, 15; Flor. Rhyn. Liv., ii., 199, 1; Marsh., Ent. Mo. Mag., ii., 145, 1; Kirschb., Cicad., 75, 4; J. Sahl., Not. Fenn., xii., 356, 1; Sign., Ess. Jass., 16, 1, pl. 1, fig. 6.

♂. Upper side lighter or darker brown, a band across the crown, a band across the pronotum, and a narrow stripe near the

claval suture, whitish; occasionally all the nerves are pale. Frons punctato-rugulose, distinctly impressed across the top. Crown about as long as the pronotum, longitudinally striate, reflexed at the apex, its middle keel exceedingly fine. Pronotum rugulose in front, transversely striate behind. Elytra coriaceous, a little longer than the abdomen, transversely rugulose, nerves raised. Breast and abdomen black. Legs pale. Length, 5—6 mm.

♀. Upper side dirty greyish or greenish yellow, more or less closely speckled with black, and frequently having a few pale spots arranged in an irregular band-like manner across the elytra, the nerves sometimes chequered with black and pale. Crown about one-fourth longer than pronotum. Elytra as long as the abdomen, the apical areas sometimes filled up with fuscous, so as to give that part a chequered appearance. Length, 6—8 mm.

Common everywhere.

Var. *a.* Upper side reddish yellow. (♀).

Var. *b.* Upper side varying in colour from red-brown to almost black. (♀).

On the salt-marshes at Wells, Norfolk, in August, 1883, under *Obione portulacoides*, I fell in with what I can only regard as a remarkable race of this very variable species; the males are distinguished by having the upper side very pale yellow-brown with a greenish tinge, and exceedingly finely irrorated with fuscous, and the shape of the crown in extreme examples is decidedly sublunate; the range of variation in the females, however, extends to the ordinary speckled form. Both sexes appear distinctly narrower than typical *nervosus*, but I have not been able to discover any structural differences on an examination of the male genitalia.

*A. carinatus*, Stål (= *variegatus*, Fieb.) has been recorded as British, but a specimen lent to me by Mr. Douglas, and labelled by Dr. Signoret, is a dark example of the speckled form of *nervosus* ♀. The true *carinatus*, which is said to resemble *nervosus* ♀, should have the crown tricarinate in both sexes.

## 2. *Acocephalus bifasciatus*, L.

*Cicada bifasciata*, Linn., Faun. Suec., ed. ii., 243, 898.

*Acocephalus bifasciatus*, Curt., Brit. Ent., 620, 9; Flor, Rhyn. Liv., ii., 201, 2; Marsh., Ent. Mo. Mag., ii., 146, 2; Kirschb., Cicad., 76, 7; J. Sahl., Not. Fenn., xii., 357, 2; Sign., Ess. Jass., 20, 3, pl. 1, fig. 8.

*A. interruptus*, Fieb., Cat. nec Scott, Ent. Mo. Mag., ix., 264.

*Jassus trifasciatus*, Germ., Mag. d'Ent., iv., 87, 21.

*Acocephalus trifasciatus*, J. Sahl., Not. Fenn., xii., 358, 3; Sign., Ess. Jass., 24, 5, pl. ii., fig. 10.

*A. dispar* and *nigritus*, Kirschb., Cicad., 76, 5 and 6.

*A. tricinctus*, Curt., Brit. Ent., 620; Sign., Ess. Jass., 22, 4, pl. ii., fig. 9.

♂. Upper side dark red-brown, varying to blackish brown; a band across the pronotum and two wide bands across the elytra white. Crown tricarinate, at least one-third longer than pronotum, strongly reflexed at the apex, the sculpture of its disc spreading obliquely on each side of the middle keel; that beyond the side keels also oblique. Pronotum uneven, with a scattered shallow punctuation in front, even and finely transversely striate behind. Elytra very finely reticulato-punctate, with a scattered shallow punctuation, about as long as the abdomen, rather narrowly rounded at the apex; one or both of the white bands are not unfrequently interrupted, and the apex is often more or less broadly white. Frons yellowish white, punctured like the elytra, with a large impression in each upper angle. Breast yellowish white, metasternum with a blackish spot on each side. Abdomen black. Legs pale, front pairs blackish at the apex; hind tibiæ and tarsi black. Length,  $3\frac{1}{2}$ —4 mm.

♀. Upper side pale brownish grey speckled with brown; elytra with two more or less interrupted pale bands, the nerves brown. Crown tricarinate, nearly twice as long as the pronotum. The whole upper side very finely reticulato-punctate, with a scattered shallow punctuation. Length,  $4\frac{3}{4}$ —5 mm.

Not common; more frequent in the north.

### 3. *Acocephalus albifrons*, L.

*Cicada albifrons*, Linn., Faun. Suec., 241, 884.

*C. nitidula*, Don., Brit. Ins., viii., 87, pl. 288, fig. 1.

*Aphrodes testudo*, Curt., Ent. Mag., i., 195.

*A. concinna*, Curt., Brit. Ent., 633, 1.

*Acocephalus arcuatus* and *confusus*, Kirschb., Cicad., 75, 3, and 78, 11.

*A. albifrons*, Flor, Rhyn. Liv., ii., 203, 3; Marsh., Ent. Mo. Mag., ii., 177, 3; J. Sahl., Not. Fenn., xii., 360, 5; Sign., Ess. Jass., 30, 9, pl. ii., fig. 14.

*A. nigropunctatus*, J. Sahl., *l. c.*, 360, 4.

*A. interruptus* and *polystolus*, Scott, Ent. Mo. Mag., ix., 264 and 265.

♂. Upper side reddish yellow, becoming darker (in some examples almost black) towards the apex of the elytra, the latter with two wide more or less interrupted bands, and the apex broadly white. Face not impressed above. Crown feebly impressed just behind the apex, about equal in length to the pronotum, its middle keel very fine. Elytra a trifle longer than the abdomen; that portion of the dark ground colour which precedes the white space at the apex frequently assumes the appearance of a black or blackish band. Under side and legs pale; hind tibiæ generally blackish. Length, 3—3½ mm.

♀. Upper side pale grey, more or less closely speckled with fuscous or black. Face very feebly impressed above. Crown tricarinate, about as long as the pronotum, more distinctly impressed than in the male. Elytra as long as the abdomen, their apex generally having a chequered appearance, owing to the apical areas being filled up with fuscous; not unfrequently two bands are indicated by a few pale spots, and generally the axillary and anal nerves are white at the apex; sometimes all the nerves of the corium are chequered with black and pale. Face pale, breast and abdomen blackish. Length, 3½—4½ mm.

Common amongst low plants. The above description applies to the ordinary form of this species as it occurs in inland situations, but in salt-marshes, under *Obione portulacoides*, &c., the following marked varieties occur:—

a. Upper side dark brown, the white spots forming the bands on the elytra very much reduced. (♂).

b. Upper side entirely very dark red-brown. (♂).

c. Upper side brownish grey, the white space at the apex of the elytra bounded inwardly by a black band.

Although, in deference to common usage, I put the three last-mentioned forms as varieties of *albifrons*, it is by no means certain that the salt-marsh insect does not constitute a good species; both sexes are at least one-third larger than the ordinary form, the angle of the crown in the male is more acute, and its apex is more distinctly reflexed; the upper side of the female is pale, uniformly and more or less closely irrorated with fuscous or black, the apices of the claval nerves are never white, nor are the elytra chequered with black and pale round the apex, as is generally the case in the ordinary form.

The difference in habitat, the larger size of both sexes, and the uniform coloration of the female, all which matters are very constant, seem to me to indicate a distinct species, although I have not detected any appreciable structural differences in the male genitalia of the two forms. According to a specimen labelled by Dr. Signoret my *c* is the *polystolus* of Fieber; the *polystolus* of Scott seems to be my *a*.

4. *Acocephalus brunneo-bifasciatus*, Geoffr.

*Cicada brunneo-bifasciata*, Geoffr., Hist. Abr. Ins., 425, 22.

*C. serratulæ*, Fab., Ent. Sys., iv., 41, 63.

*Jassus serratulæ*, H.-Scff., Deuts. Ins., 130, 5.

*Acocephalus serratulæ*, Kirschb., Cicad., 78, 12; J. Sahl., Not. Fenn., xii., 362, 6.

*A. brunneo-bifasciatus*, Sign., Ess. Jass., 36, 10, pl. ii., fig. 15.

♂. Very similar in appearance to the ordinary form of the preceding species, but the crown, which is about as long as the pronotum, and has a fine middle keel, is feebly convex instead of impressed. The following differences in coloration, which are sufficiently constant, facilitate its separation from *albifrons*: the hind margin of the pronotum is broadly white, the space between the first and second white bands on the elytra is equal in depth of colour to the space between the second white band and the white space at the apex, which is seldom or never the case in the ordinary form of *albifrons*, and the apices of the tibiæ and the tarsi of the front pairs of legs are much more conspicuously black. Length, 4 mm.

♀. I do not know this sex, but, judging from descriptions, it is greyish yellow, more or less closely speckled with fuscous, with some whitish spots on the suture, and the apical areas filled up with fuscous.

Amongst herbage at the roots of trees, &c.; not common.

5. *Acocephalus histrionicus*, Fab.

*Cercopis histrionicus*, Fab., Ent. Syst., iv., 56, 44; Sys. Rhyn., 98, 62.

*Acocephalus histrionicus*, Flor, Rhyn. Liv., ii., 208, 5; Marsh., Ent. Mo. Mag., ii., 179, 5; Kirschb., Cicad., 77, 9; J. Sahl., Not. Fenn., xii., 364, 8; Sign., Ess. Jass., 38, 11, pl. ii., fig. 16.

*A. arenicola*, Marsh., l. c., 180, 6, sec. spec. comm.

♂. Face yellowish white; forehead black, with a roundish white spot in the middle, and sometimes another on each side; crown yellowish white, with a band across the apex, a roundish spot on each side of the base, and a line down the middle, black. Pronotum white, the hind margin narrowly, and a band on the front half, black. Scutellum blackish. Elytra whitish hyaline, the nerves narrowly, and a band before the apex, black. Crown a trifle shorter than the pronotum, finely but distinctly reticulato-punctate, its middle keel very fine. Abdomen black. Legs pale; tarsi of the front pairs and tibiæ and tarsi of the hind pair blackish. Length, 4 mm.

♀. Upper side dirty greyish white, more or less variegated with fuscous. Crown and pronotum with a coarse rough punctuation, which passes into transverse striation on the hinder half of the latter, the former tricarinate. Elytra longer than the abdomen; costa and inner margin blackish, widely interrupted with white; a fuscous spot on the hind margin in each of the apical areas; nerves brownish, more or less interrupted with white. Length, 4½ mm.

On coast-sands, &c.; not very common.

#### 6. *Acocephalus flavostriatus*, Don.

*Cicada flavostriata*, Don., Brit. Ins., viii., 28, pl. 288, fig. 2.

*Jassus rivularis*, Germ., Mag. d'Ent., iv., 89, 26.

*Aphrodes rivularis*, Curt., Brit. Ent., 633, 8.

*Acocephalus rivularis*, Flor, Rhyn. Liv., ii., 205, 4; Marsh., Ent. Mo. Mag., ii., 178, 4; Kirschb., Cicad., 77, 10; J. Sahl., Not. Fenn., xii., 364, 7; Sign., Ess. Jass., 39, 12, pl. ii., fig. 17.

♂. Yellowish white; a black patch on the disc of the face and one on each side above, a band across the apex, a toothed band on the hind margin and sometimes a line down the middle of the crown, a band across the pronotum, a spot on the disc and the angles of the scutellum, and the spaces between the nerves of the elytra, black. Breast and abdomen beneath pale, a spot on each side of the former and a stripe on each side of the latter black. Legs pale; the apices of the tibiæ and tarsi of the front pairs, the apices of the hind thighs, and the hind tibiæ and tarsi wholly, black. Crown a little longer than the pronotum, finely reticulato-punctate, its middle keel very fine and indistinct. Length, 3 mm.

♀. Upper side dirty greyish yellow, the fore parts more or less closely mottled with fuscous or black, the spaces between the

nerves of the elytra fuscous. Crown about one-third longer than pronotum, tricarinate, the side keels obtuse and indistinct. Length,  $3\frac{1}{2}$ —4 mm.

Very common amongst low plants, especially in damp places.

iii. EUPELIX, *Germ.* (Pl. III., fig. 4).

Germar, *Mag d'Ent.*, iv., 94 (1821).

Head subtriangular, as long or longer than the pronotum and scutellum together, very thin and flat, more or less strongly reflexed at the apex. Crown with a strong middle keel and an oblong callus on each side at the base. Frons with a sharp middle keel. Pronotum with three keels, one in the middle and one behind each eye, its sides of considerable length, and separated from the prosternum by a distinct ridge. Elytra subcoriaceous, rounded and not overlapping at the apex; appendix very narrow; nerves strongly raised; one transverse nerve. Wings of the Jassid type.

1. *Eupelix cuspidata*, Fab.

*Cicada cuspidata*, Fab., *Ent. Syst.*, iv., 46, 86.

*C. depressa*, Fab., *Sys. Rhyn.*, 66, 19.

*Eupelix cuspidata*, *Germ.*, *Mag. d'Ent.*, iv., 94, 1; Fall., *Hem. Suec.*, ii., 22, 1; Flor., *Rhyn. Liv.*, ii., 215, 2; Marsh., *Ent. Mo. Mag.*, ii., 199, 2; Kirschb., *Cicad.*, 79, 1; J. Sahl., *Not. Fenn.* xii., 367, 1; Sign., *Ess. Jass.*, 11, 3, pl. i., fig. 3; Scott, *Ent. Mo. Mag.*, xv., 232, 1.

*E. producta*, *Germ.*, *Faun. Ins. Eur.*, xx., 24; *Burm.*, *Gen. Ins.*, ii., figs. 1 and 5; Flor., *Rhyn. Liv.*, ii., 215, 1; Marsh., *Ent. Mo. Mag.*, ii., 198, 1; Kirschb., *Cicad.*, 80, 3; J. Sahl., *Not. Fenn.*, xii., 368, 2; Sign., *Ess. Jass.*, 10, 2, pl. i., fig. 2; Scott, *Ent. Mo. Mag.*, xv., 233, 2.

*E. spatulata*, *Germ.*, *Faun. Ins. Eur.*, xx., 25; *Burm.*, *Gen. Ins.*, i., fig. 6; Kirschb., *Cicad.*, 80, 4; J. Sahl., *Not. Fenn.*, xii., 369, 3; Scott, *Ent. Mo. Mag.*, xv., 233, 3.

*E. depressa*, Sign., *Ess. Jass.*, 8, 1, pl. i., fig. 1.

Yellowish grey; head with dark brown or black markings; elytra sparingly irrorate with dark brown or black, the spots being chiefly confined to the nerves; abdomen with five black stripes, three above and two below.

♂. Crown with a wide central stripe, a transverse marking before the apex, and one or more curved bands proceeding from the middle keel to the side margin, and widening outwardly, dark brown or black. Of these markings the transverse one before the apex is the most constant.

♀. Paler, the irroration on the elytra almost or entirely wanting, and the markings on the crown reduced to a central stripe, and a few spots on the margin round the apex. Length,  $5\frac{1}{2}$ — $7\frac{1}{4}$  mm.

At the roots of low plants; not very common.

This species is usually divided into three, namely:—

1, *cuspidata*, Fab., having the crown broader than long, its sides strongly rounded, and the apex somewhat cuspidate (in the female with the sides nearly straight).

2, *depressa*, Fab., having the crown longer than broad, with its sides strongly sinuate.

3, *producta*, Germ., a form intermediate between the two preceding, having the crown somewhat equilaterally triangular, its sides straight or very faintly concave near the ocelli.

All these forms may sometimes be taken in company. The characters laid down by authors derived from the genitalia are simply differences of degree.

#### iv. PLATYMETOPIUS, *Burm.* (Pl. III., fig. 7).

Burmeister, *Gen. Ins.*, ii. (1839).

Crown angularly produced, impressed across the base, its apex somewhat reflexed. Forehead forming a strong ridge in the male. Upper margin of the frons narrowly impressed. Sides of pronotum distinctly separated from prosternum. Elytra ample, with two or three extra transverse nerves in the costal area towards the apex; appendix narrow. Wings of the Jassid type.

##### 1. *Platymetopius undatus*, DeGeer.

*Cicada undata*, DeGeer, *Abh. Gesch. Ins.*, iii., 119, 5, t. 1, fig. 24; Fall., *Hem. Suec.*, ii., 29, 7.

*Platymetopius undatus*, Flor, *Rhyn. Liv.*, ii., 221, 1; Kirschb., *Cicad.*, 147, 27; Fieb., *Syn. Eur. Delt.*, 202, 4, t. 6, fig. 64 (excluding *f*); J. Sahl., *Not. Fenn.*, xii., 296, 1; Scott, *Ent. Mo. Mag.*, xix., 155.

*P. undulatus*, Thoms., *Opusc. Ent.*, i., 46, 1.

♂. Deep yellow; the disc of the crown, the pronotum, and an angularly-bisinate stripe narrowly white on its outer edge and occupying the inner half of each elytron, chocolate-brown, finely speckled with yellow; along the suture, and in the base of the apical and the apex of the subapical areas, a few (about nine) small round white spots; abdomen above widely black down the middle. Crown as long as the pronotum, distinctly longer than its width between the eyes. Elytra parallel-sided, their apex truncate, with rounded angles. Genital valve subequilaterally triangular, plates about twice as long as the valve, subnavicular, rather abruptly reflexed about the middle, acuminate at the apex.

♀. Similar in colour to the male, but the crown is distinctly shorter than its width between the eyes. Last ventral segment about one-half longer than the preceding, the subquadrate middle lobe of its hind margin bounded on each side by a deep angular notch, and having its hind angles produced into a spine, and a small notch in the middle of its hind margin. Fieber's figure (Syn. Eur. Delt., t. 6, fig. 64, *f*) does not represent the last ventral segment of this species. Length, 5—6 mm.

On *Pteris*; Cann Quarry, Bickleigh Vale (*Scott*, 1882).

#### v. GRAPHOCRÆRUS, *Thoms.* (Pl. III., fig. 2).

Thomson, *Opusc. Ent.*, i., 57 (1869).

Crown subangularly produced, impressed on each side at the base, reflexed at the apex. Frons convex, slightly impressed above. Pronotum separated from prosternum by a ridge. Elytra snbopaque, with one transverse nerve. Wings of the Jassid type. ♂: Genital valve present; plates wide, convex, subvertical, diverging behind; lower angle of pygofer strongly acuminate.

#### 1. *Graphocrærus ventralis*, Fall.

*Cicada ventralis*, Fall., *Act. Holm.*, 18, 9 (1805);  
Hem. Suec., ii., 31, 9.

*Athysanus ventralis*, Flor, *Rhyn. Liv.*, ii., 277, 3:  
Kirschb., *Athys. Art.*, 13, 17; *Cicad.*, 122, 76.

*Graphocrærus ventralis*, *Thoms.*, *Opusc. Ent.*, i., 57,  
25; *J. Sahl.*, *Not. Fenn.*, xii., 289, 1; *Scott*, *Ent.*  
*Mo. Mag.*, xii., 25.

Greenish yellow; a point above the base of each antenna, a pair of points on the apex of the frons, a row of four equidistant points across the crown, and four points on the pronotum, one behind each eye and a pair in the middle near the front margin, black;

abdomen black at the base in the male; tibiæ with black points. Crown somewhat longer than half the width of its hind margin, a trifle shorter than the pronotum, nearly twice as long in the middle as at the sides. Elytra somewhat longer than the abdomen (♂) or shorter than the same (♀); the apical areas short. In the female the two lateral, or all the black points on the pronotum, are sometimes wanting, and the elytra are occasionally clouded with grey in the middle. Length,  $5\frac{1}{2}$ —6 mm.

Not common; Weybridge and Lee, July; Abbey Wood, August.

vi. *DORATURA*, *J. Sahl.* (Pl. III., fig. 8).

*J. Sahl.*, Not. Fenn., xii., 291, 30 (1871).

Crown subangularly produced, widely impressed across the base, reflexed at the apex. Frons flat, transversely impressed above. Sides of pronotum not margined. Insect generally brachypterous, in which case the elytra are less than one-half as long as the abdomen and truncate behind. First and second wing-nerves confluent and forming one nerve shortly before the apex of the wing. Apex of the abdomen in the female strongly acuminate.

### 1. *Doratura stylata*, Boh.

*Athysanus stylatus*, Boh., Sv. Ak. Handl., 1847, 37, 5;  
Kirschb., Athys. Art., 14, 18; Cicad., 123, 77;  
Flor, Rhyn. Liv., ii., 273, 1.

*Jassus stylatus*, Thoms., Opusc. Ent., i., 58, 27.

*Doratura stylata*, *J. Sahl.*, Not. Fenn., xii., 292, 1;  
Scott, Ent. Mo. Mag., xi., 148, 1.

♂. Pale grey or yellowish grey; three spots on the forehead, of which the middle one is the largest and oblong, two bands across the face, and sometimes some markings on the loræ and clypeus, black. Crown obtusely produced, one-half longer in the middle than at the sides, and one-third longer than the pronotum, which is at least three times as wide as long. Elytra coriaceous, rugulose, rather more than one-third as long as the abdomen, their apex truncate, with rounded angles. Abdomen above with one or two fine black longitudinal lines on each side broken up into points or short lines, and frequently a transverse row of black points across each segment; on the under side each segment is occupied by a large crescent-shaped black spot. Legs pale; front pairs of thighs sometimes with a black band near the apex; hind tibiæ with a black stripe on the inner side and a row of black

points on the outer side. Pygofer with three black spots above; genital valve extremely short; plates about as long as the last ventral segment, obtusely rounded at the apex.

♀. A small suboval spot in the middle of the last dorsal segment, the hind margin of the latter and a fine line down the middle of the pygofer above black; otherwise coloured like the male. Last ventral segment one-half longer than the preceding, subtruncate behind; saw-case about three times as long, its apical third free.

*Macropterous form*.—Elytra dirty whitish, subopaque, scarcely reaching to the apex of the last dorsal segment; appendix of nearly equal width throughout, reaching as far as the first apical area. Length,  $2\frac{3}{4}$ —4 mm.

Common on the ground on heaths, coast-sands, &c.; the macropterous form very rare. On the sand-hills at Hunstanton, in July, 1885, I took several examples of a large pale race of this species. In actual measurement these are about one-half larger than the ordinary form ( $\sigma$  4 mm.,  $\text{♀}$   $5\frac{1}{2}$  mm.), but the difference in size is apparently much greater; the ordinary form occurred in a salt-marsh just behind the sand-hills, but the two races were not intermingled. I have not detected any structural differences between the two. *Doratura homophylla*, Flor, a species not unlikely to occur here, is distinguished by the genital valve in the male, which is nearly as long as the last ventral segment, and the last ventral segment in the female, which is twice as long as the preceding segment, and roundly produced behind.

vii. PARAMESUS, *Fieb.* (Pl. III., fig. 9).

Fieber, *Neue Gatt. und Art. Homop.*, 10, 27 (1866).

Crown sublunate or slightly produced, with a wide transverse impression on the disc. Forehead and front of the crown transversely striate. Frons flattish, dull, exceedingly finely and closely punctured. Sides of pronotum very short, not margined. Elytra about as long or a little longer than the abdomen, normally with two transverse nerves; appendix very narrow or entirely wanting. Wings of the Jassid type.

Our two species may be distinguished as follows:—

- |   |                        |
|---|------------------------|
| Frons between the antennæ nearly three times as wide as the base of the clypeus. Insect broad .. ..   | 1. <i>nervosus</i> .   |
| Frons between the antennæ not more than twice as wide as the base of the clypeus. Insect narrow .. .. | 2. <i>phragmitis</i> . |

1. *Paramesus nervosus*, Fall.

*Cicada nervosa*, Fall., Hem. Suec., ii., 39, 23.

*Athysanus obtusifrons*, Stal, Ofv., 174, 4.

*Paramesus obtusifrons*, Fieb., Neue Gatt. und Art. Hom., 10, 19, pl. vii., fig. 20.

*Jassus nervosus*, Thoms., Opusc. Ent., i., 65, 43.

*Paramesus nervosus*, J. Sahl., Not. Fenn., xii., 286, 1.

*Athysanus Verralli*, Scott, Ent. Mo. Mag., xi., 268.

*A. nervosus*, Scott, l. c., xii., 168, 15.

♂. Oblong, brownish yellow; forehead with a pale yellow transverse line, bounded above and below by an arcuate black one; frons black or brown, with a few pale curved transverse lines and some indication of a pale middle stripe below; outline of the loræ and clypeus and a line down the middle of the latter black; front margin of pronotum narrowly black. Scutellum sometimes with a dark triangle in each basal angle. Nerves of the elytra pale, the areas of the corium evenly margined with black, the apical areas dark fuscous. Crown a little longer in the middle than at the sides, and about equal in length to one-half of its basal width. Pronotum about two and a half times as wide as long, one-third longer than the crown, and subequal in length to the scutellum. Abdomen black. Legs pale, striped, spotted, and banded with black.

♀. Similar in coloration to the male, but larger and much paler; the dark margins to the areas fuscous or entirely wanting. Abdomen pale, striped with fuscous. Length, 6—6½ mm.

On rushes in muddy salt-marshes; local, but abundant where it occurs.

2. *Paramesus phragmitis*, Boh.

*Thamnotettix phragmitis*, Boh., Sv. Ak. Handl., 1847, 34, 7; Kirschb., Cicad., 100, 35.

*Jassus phragmitis*, Thoms., Opusc. Ent., i., 65, 50.

*Deltocephalus phragmitis*, Fieb., Syn. Eur. Delto., 3, 2, fig. 2.

*Paramesus phragmitis*, J. Sahl., Not. Fenn., xii., 287, 2.

Elongate. Crown slightly roundly produced, somewhat shorter than the pronotum, whitish, with two rust-yellow patches on the disc; forehead with a whitish band, bounded above and below by a black line. Frons narrow with nearly straight sides, pale brown, sometimes with a few pale curved lines on each side. Pronotum

whitish, with six rust-yellow spots, two in front and four in a transverse row behind. Scutellum whitish, with three sometimes confluent rust-yellow spots. Elytra greyish yellow, distinctly longer than the abdomen; nerves thickened, whitish, narrowly margined with fuscous; two points near the apex and some streaks on the costa behind the middle black. Abdomen above black, sides pale, beneath pale with black side stripes. Legs pale yellow, with black points. Length, 4—5 mm.

I introduce this addition to our fauna on the strength of a single specimen which I found amongst some Cicadina sent to me for names by Mr. Buckton; he is positive that the example in question is British, and is nearly certain that it was taken at Haslemere. It occurs in South Finland on reeds from July to September.

viii. GLYPTOCEPHALUS, *Edw.* (Pl. III., fig. 10).

Edwards, Ent. Mo. Mag., xx., 148 (1883).

Crown subangularly produced, with a narrow impression running parallel with its front margin. The temples and front margin of the crown transversely striate. Frons rather flat, dull, exceedingly finely and closely punctured with some transverse curved rows of large shallow punctures above. Angle of the cheeks almost a right angle. Sides of pronotum exceedingly short, not margined. Elytra a trifle shorter than the abdomen, their apices rounded and overlapping; appendix extremely narrow; one transverse nerve. Wings of the Jassid type.

1. *Glyptocephalus proceps*, Kbm.

*Athysanus proceps*, Kirschb., Cicad., 105, 44.

*A. canescens*, Doug. and Scott, Ent. Mo. Mag., ix., 210; Scott, Ent. Mo. Mag., xii., 95, 1.

*Glyptocephalus canescens*, Edw., Ent. Mo. Mag., xx., 148.

Very pale yellow; elytra white, with a peculiar hoary appearance, which is very conspicuous during life; the areas, except the brachial, generally occupied by a black or fuscous stripe; a stripe along the lower margin of each eye as far as the antenna, a wide curved band across the upper part of the frons, the apex of the rostrum, the facial sutures very narrowly, three acuminate stripes on the upper side of the abdomen, and sometimes two or three on its under side, an angular patch on the mesosternum, a spot on each front coxa, and sundry lines, bands, and points on the legs,

black. Crown pointed, twice as long in the middle as at the sides, about as long as half its basal width. Pronotum as long as the crown or a little longer, its hinder half transversely striate. Length, 4—5 mm.

Amongst grass; widely distributed, but not common.

#### XIV. JASSIDÆ.

Oblong or elongate species of small or medium size. Ocelli on the forehead, which is more or less obtuse and never keeled. Upper branch of the cubital nerve sometimes obsolete or wanting, the lower branch joined to the brachial nerve by one or two transverse nerves. Submarginal wing-nerve complete; first and third wing-nerves simple, the second forked, its upper and lower branches either connected with the first and third respectively by a transverse nerve or shortly confluent with those nerves, except in *Gnathodus*, where the upper branch is confluent with the first wing-nerve as far as the submarginal nerve. Front pairs of tibiæ subterete, spinose on the outer side; hind tibiæ quadrangular-prismatic, with four rows of spines.

A somewhat numerous group, distinguished from all our other species with multispinose hind tibiæ by the position of the ocelli, the absence of any well-defined border separating the crown from the face, and the branched nerves of the corium.

The black markings which occur on the heads of many members of the genus *Athysanus*, and some others of this family, notwithstanding a great tendency either to exaggeration or reduction, frequently form valuable aids to identification, and the following names for the various parts of what may be considered as the normal pattern are proposed with a view to render intelligible any reference to the subject in the descriptions which follow.

Proceeding forwards from the hind margin of the crown we have:—

- 1st. Two *basal markings*, one on each side, generally either punctiform or annular.
- 2nd. An *interocular line*, running straight across the crown at the level of the apex of the inner margin of the eye.
- 3rd. The *interocellar line*, connecting the ocelli and sometimes extending as far as the eyes, widened, angularly bent forward, and generally interrupted in the middle.

4th. The *infraocellar line*, which runs across the forehead and adjoins the ocelli on their lower side. This line, which is frequently biarcuate and sometimes interrupted in the middle, is not to be confounded with the uppermost of the ordinary series of transverse lines on the frons, from which it is quite distinct in character.

These details are present in various combinations in different species, but the whole may generally be observed in a well-marked example of *Athysanus sordidus*, Zett. In several species of *Athysanus*, &c., there exists a dark form, generally of the male sex, in which all the dark markings proper to the species are very strongly developed, and which has consequently a very different appearance to the prevalent form. *Athysanus piccus*, Scott, is a case in point. This insect is the dark form of *Athysanus obsoletus*, Kbm., as pointed out to me by Dr. J. Sahlberg, and since confirmed by the examination of a series of intermediate examples and the dissection and comparison of the male genitalia. In working from descriptions of the female only it should be borne in mind that the crown in that sex is usually longer and more pointed than in the male, and the general coloration is paler.

## TABLE OF GENERA.

- |    |  |                     |
|----|--|---------------------|
| 1  | (6). Elytra not overlapping at the apex.   |                     |
| 2  | (5). Crown not sharply angular in front, seldom longer than the pronotum. Species for the most part large and stout. |                     |
| 3  | (4). Elytra hyaline .. .. .  | i. STICTOCORIS.     |
| 4  | (3). Elytra subcoriaceous .. .. .  | ii. ATHYSANUS.      |
| 5  | (2). Crown sharply angular in front, frequently much longer than the pronotum. Species small and narrow .. .. .      | iii. DELTOCEPHALUS. |
| 6  | (1). Elytra distinctly overlapping at the apex.  |                     |
| 7  | (12). Inner margin of the clavus much longer than the membrane.  |                     |
| 8  | (11). Sides of pronotum of moderate length, separated from prosternum by a distinct keel.                            |                     |
| 9  | (10). Crown widely rounded in front. Elytra with many supernumerary white transverse nerves .. .. .                  | iv. ALLYGUS.        |
| 10 | (9). Crown angularly produced in front. Supernumerary white transverse nerves, if present, very few .. .. .          | v. THAMNOTETTIX.    |

- 11 (8). Sides of pronotum extremely short; keel  
 obsolete or wanting .. .. vi. LIMOTETTIX.
- 12 (7). Membrane as long as the inner margin of  
 the clavus .. .. vii. GNATHODUS.

i. *STICTOCORIS*, *Thoms.* (Pl. III., fig. 11).

Thomson, *Opusc. Ent.*, i. (1870).

Body robust, ovate. Head with the eyes wider than the pronotum, obtuse in front. Crown convex, sublunate, very feebly roundly produced in the middle. Frons longer than its width across the base; cheeks wide, base of the loræ subequal in width to the base of the clypeus. Rostrum stout, longer than the clypeus. Sides of the pronotum very short, obtusely and indistinctly margined. Elytra hyaline, ample, about as long as the abdomen, not overlapping at the apex; appendix very narrow; four short apical and five subapical areas.

1. *Stictocoris Preyssleri*, H.-Scff.

*Jassus Preyssleri*, H.-Scff., *Deuts. Ins.*, 164, 7; *Flor. Rhyn. Liv.*, ii., 288, 8; *Kirschb., Cicad.*, 121, 75; *Thoms., Opusc. Ent.*, i., 61, 13.

*Thamnotettix adumbrata*, Boh., *Sv. Ak. Handl.*, 41, 16 (1847).

*Stictocoris Preyssleri*, J. Sahl., *Not. Fenn.*, xii., 258, 3.

*Thamnotettix Preyssleri*, Scott, *Ent. Mo. Mag.*, xii., 25, 11; Fieb., *Cicad. d'Eur. (Thamnotettix)*, 99.

Pale yellowish white; four spots on the crown, one at the base, and three at the front margin, the latter continued on to the frons, a spot at the base of each antenna sometimes, and a wide middle stripe on the pronotum and scutellum, black; elytra hyaline, with the inner margin narrowly and a stripe running along the inner branch of the cubital nerve, and fading behind, fuscous or black. Crown obtusely pointed, one-half longer in the middle than at the sides, and about half as long as its basal width. Abdomen above black, narrowly yellow at the sides; beneath yellow, with a black middle stripe. Legs yellow, with or without black lines and points. Length, 3—3½ mm.

Said to occur in July and August on *Genista*.

ii. *ATHYSANUS*, *Burm.* (Pl. III., fig. 12).Burmeister, *Gen. Ins.*, ii. (1838).

Body robust, somewhat rounded at the sides. Head with the eyes somewhat wider than the pronotum, obtuse in front; crown obtusely produced, convex above, ocelli near the eyes; frons wide, somewhat convex; clypeus wide, its base distinctly wider than the base of the lora; cheeks wide, reaching to the apex of the clypeus. Pronotum short, transverse, its sides not or only faintly margined. Elytra subcoriaceous, not overlapping at the apex, sides slightly rounded; five subapical areas; appendix wanting or extremely narrow; generally somewhat or even much shorter than the abdomen, with very short apical areas, but occasionally longer than the abdomen, with the apical areas fully developed, in which case the elytra overlap somewhat at the apex, owing to the development of the appendix; wings frequently much abbreviated.

## TABLE OF SPECIES.

- |    |  |   |
|----|--|---|
| 1  | (2). Upper side rust-red, with or without dark dark markings .. .. .                                     | 1. <i>russeolus</i> .                   |
| 2  | (1). Upper side not as above.  |   |
| 3  | (10). Dark markings of the crown a transverse line or lines, or entirely wanting.                        |   |
| 4  | (9). Interocular line level with the apex of the inner margin of the eye.                                |   |
| 5  | (8). Front of crown angular.   |   |
| 6  | (7). Species smaller, angle of crown more pointed, pronotum at least three times as broad as long.. .. . | 2. <i>brevipennis</i> .                 |
| 7  | (6). Species larger, angle of crown less pointed, pronotum about twice as broad as long ..               | 3. <i>sordidus</i> .                    |
| 8  | (5). Front of crown roundly produced .. ..   | 4. <i>Sahlbergi</i> .                   |
| 9  | (4). Interocular line placed considerably behind the apex of the inner margin of the eye                 | 5. <i>grisescens</i> .                  |
| 10 | (3). Crown with several black spots, but no transverse line.   |   |
| 11 | (16). Elytra more or less closely speckled with black.   |   |
| 12 | (13). Transverse nerve and the apices of the anal and axillary nerves milk-white .. ..                   | 6. <i>communis</i> .                    |
| 13 | (12). No milk-white spots on the elytra.   |   |
| 14 | (15). Length, 3—3½ mm. Outer margin of genital plates straight .. .. .                                   | 7. <i>obscurellus</i> .                 |
| 15 | (14). Length, 4½—5½ mm. Outer margin of genital plates gently convex ..                                  | <i>obsoletus</i> (var. <i>piccus</i> ). |
| 16 | (11). Elytra not or scarcely speckled with black.  |   |
| 17 | (18). Frons suddenly narrowed at the level of the antennæ. Species large and wide ..                     | 8. <i>obsoletus</i> .                   |
| 18 | (17). Frons regularly narrowed throughout. Species small and narrow .. .. .                              | 9. <i>melanopsis</i> .                  |

1. *Athysanus russeolus*, Fall.

*Cicada russeola*, Fall., Hem. Suec., ii., 34, 14.

*Jassus russeolus*, Thoms., Opusc. Ent., i., 56, 24.

*Athysanus russeolus*, J. Sahl., Not. Fenn., xii., 274, 10.

Fore parts rust-red; elytra pale brown, generally with all the areas narrowly margined with fuscous. Crown obtusely produced, one-half longer in the middle than at the sides, and about half as long as its basal width; interocular line straight, narrowly interrupted in the middle; interocellar line interrupted in the middle, the inner end of each half suddenly bent forward; infraocellar line biarcuate, interrupted in the middle. Frons with a double middle stripe, a few transverse curved lines down each side, and the facial sutures, black. Pronotum about one-third longer than the crown, sparingly speckled with black. Elytra subcoriaceous, about as long as the abdomen, narrowed behind; nerves concolorous; appendix very narrow. Abdomen rust-red, darker down the middle of the back. Legs striped and spotted with fuscous. Length,  $3\frac{1}{2}$  mm.

Pitlochry, Perthshire (*Norman*); Addington Hills (*Douglas*). The dark markings of the upper side are sometimes wanting, but the species may always be easily identified by the rust-red ground colour of its fore parts. It is said to occur on heath in July and August.

2. *Athysanus brevipennis*, Kbm.

*Athysanus brevipennis*, Kirschb., Athys. Art., 9, 9;

Cicad., 113, 61; Flor, Rhyn. Liv., ii., 305, 15;

J. Sahl., Not. Fenn., xii., 270, 7.

*A. depressus*, Scott, Ent. Mo. Mag., xii., 95, 2.

*Jassus porrectus*, Thoms., Opusc. Ent., i., 56, 22.

Upper side shining lighter or darker brownish yellow; frons with the usual curved transverse lines. Crown as long or slightly longer than the pronotum, at least twice as long in the middle as at the sides, subequal in length to half its basal width; interocular line abbreviated at each end, scarcely interrupted in the middle; infraocellar line biarcuate, generally very faint; interocellar line wanting. Elytra about one-third shorter than the abdomen, obliquely subtruncate at the apex, the apical areas extremely short; nerves pale, frequently narrowly bordered with fuscous. Abdomen pale, blackish towards the base; each of the apical dorsal segments frequently bearing a transverse row of dark points. Legs concolorous, with the usual dark markings. Length,  $3\frac{1}{2}$ —4 mm.

Braemar; Pitlochry; Huddersfield. A small rather flat species, easily recognised by its Deltocephaloid crown and pronotum.

### 3. *Athysanus sordidus*, Zett.

*Cicada sordida*, Zett., Faun. Ins. Lapp., i., 531, 26.

*Thamnotettix sordidus*, Zett., Ins. Lapp., 295, 14.

*Jassus sordidus*, H.-Scff., Deuts. Ins., 130, 12; Flor., Rhyn. Liv., ii., 296, 12; Thoms., Opusc. Ent., i., 55, 21.

*Athysanus confusus*, Kirschb., Cicad., 107, 46.

*A. sordidus*, J. Sahl., Not. Fenn., xii., 265, 4; Scott, Ent. Mo Mag., xii., 96, 4; Reut., Medd. Faun. Flor Fenn., v. (1880), 224.

Oblong, slightly rounded at the sides; female much narrowed behind; elytra slightly ( $\sigma$ ) or one-third or more ( $\rho$ ) shorter than the abdomen; nerves whitish. Crown a little longer than half its basal width, twice as long in the middle as at the sides, a trifle shorter than the pronotum, its free sides nearly straight, the angle pointed; interocular line generally widely interrupted in the middle; interocellar line feeble; infraocellar line biarcuate. A very variable species in point of colour. The normal form is pale yellowish grey, with the lines on the head and some markings on the pronotum and scutellum black, and the areas of the elytra more or less filled up with fuscous. The dark form of the male has the elytra black with pale nerves, but a very pale immaculate form of both sexes is perhaps the most frequent. Of the dark markings on the elytra, a spot next the transverse nerve is the last to disappear. Hind margin of the last ventral segment in the female subangularly concave, with a strong black triangular tooth in the middle. Length,  $3\frac{1}{2}$ — $4\frac{1}{2}$  mm.

Common and generally distributed. The macropterous form, which is rare, has the elytra a little longer than the abdomen, and slightly overlapping at the apex.

### 4. *Athysanus Sahlbergi*, Reut.

*Athysanus Sahlbergi*, Reut., Medd. Faun. Flor Fenn., v. (1880), 209 and 219.

*A. æmulans*, J. Sahl., Not. Fenn., xii., 264, 3 ( $\sigma$ ).

*A. confusus*, J. Sahl., l. c., 267, 5 ( $\rho$ ).

Similar to the preceding, but larger and stouter, with both the crown and forehead much more obtuse. Crown one-fourth longer

in the middle than at the sides, in the female as long, in the male a little longer than half its basal width, its free sides curved, and the angle rounded off. All the markings on the head, except the infraocellar line, more or less distinct. A few black or fuscous points on the front half of the pronotum, a double fuscous stripe on the scutellum, sometimes continued on the hinder half of the pronotum, and the areas of the elytra, more or less filled up with fuscous. Length,  $4\frac{1}{2}$ — $5\frac{1}{2}$  mm.

Pitlochry (*Norman*); Norfolk. Not common; sometimes it occurs in company with *A. sordidus*, but it appears to be restricted to very marshy places; in the field it might be easily passed over as *A. obsoletus*, although I have seldom met with it in company with that species.

#### 5. *Athysanus grisescens*, Zett.

*Cicada grisescens*, Zett., Faun. Ins. Lapp., i., 570, 25.

*Thamnotettix grisescens*, Zett., Ins. Lapp., 295, 15.

*Jassus grisescens*, Flor. Rhyn. Liv., ii., 300, 13;  
Kirschb., Cicad., 106, 45; Thoms., Opusc. Ent.,  
i., 54, 19.

*Athysanus cognatus*, Doug. and Scott, Ent. Mo. Mag.,  
ix., 211.

*A. validinervis*, Kirschb., Cicad., 113, 60 (♀).

*A. grisescens*, Scott, Ent. Mo. Mag., xii., 95, 3;

J. Sahl., Not. Fenn., xii., 268, 6; Reut., Medd.

Faun. Flor Fenn., v. (1880), 208 and 220.

Greyish yellow; nerves of the elytra whitish. Crown two-thirds longer in the middle than at the sides, subequal in length to the pronotum, its free sides straight, and the angle pointed; interocular line not interrupted in the middle, forked at each end, the lower branch joining the basal spot; interocellar line entire; infraocellar line obsolete or wanting. Pronotum and scutellum sometimes with a few fuscous markings. Elytra a little shorter than the abdomen, narrowly rounded at the apex, in the macropterous form as long as or a little longer than the abdomen, with the suture and some of the areas narrowly margined with blackish, and the apical areas more or less filled up with the same colour. Hind margin of the last ventral segment in the female subangularly concave, with a bifid process in the middle. Length,  $5$ — $5\frac{1}{2}$  mm.

Moderately common amongst grasses, May to July. An entirely pale form is not unfrequent.

6. *Athysanus communis*, J. Sahl.

*Athysanus communis*, J. Sahl. (MS.)

*Jassus plebejus*, Flor, Rhyn. Liv., ii., 291, 10; Kirschb., Cicad., 111, 54.

*Athysanus plebejus*, Kirschb., Athys. Art., 8, 6; Scott, Ent. Mo. Mag., xii., 98, 8.

Pale brownish yellow; elytra sparingly speckled with black along the nerves; transverse nerve and the apices of the anal and axillary nerves milk-white. Crown in the male as long as half its basal width, one-half longer in the middle than at the sides; in the female a little shorter than half its basal width, twice as long in the middle as at the sides; the free margin in the male subparallel with the curve of the hind margin, in the female forming an obtuse but distinct angle. Pronotum about two-thirds longer than the crown. Markings on the crown precisely similar in form to those of *A. obscurellus*, but in point of intensity only equal to the female of that species. Frons pale, with black transverse lines, its middle line pale at least below. Elytra as long as or a little shorter than the abdomen, widely rounded at the apex; nerves whitish. Abdomen above black, margins of the segments narrowly yellow, under side black, with a row of yellow spots down each side, or yellow, with a wide more or less interrupted black stripe down the middle. Legs striped and spotted with black; thighs only occasionally with a black band near the apex. Length, 4—5½ mm.

Common amongst grasses, especially in damp places. Very closely allied to *A. obscurellus*, but distinguishable by its larger size, wider and more obtuse form, paler colour, and the milk-white spots on the elytra.

7. *Athysanus obscurellus*, Kbm.

*Athysanus obscurellus*, Kirschb., Athys. Art., 10, 11;

Cicad., 115, 64; Scott, Ent. Mo. Mag., xii., 98, 9.

*Acocephalus agrestis*, Marsh., Ent. Mo. Mag., ii., 197, 7.

Brownish yellow; elytra closely and finely speckled with black. Crown subequal in length to half its basal width, nearly one-half longer in the middle than at the sides, its free sides gently arcuate, the angle obtuse; basal markings annular; the interocular line thickened and more or less widely interrupted in the middle; interocellar line broken up into four spots; infraocellar line biarcuate, well-defined. Frons black, the usual lines yellow.

Pronotum one-third longer than the crown, with a few black spots in front, behind with four dark stripes, each composed of short transverse black lines. Scutellum with some black spots. Elytra gently rounded at the sides, a little longer than the abdomen, widely rounded at the apex; nerves a little paler than the disc. Abdomen black. Legs striped, spotted, and banded with black. In the female the crown is nearly twice as long in the middle as at the sides, the speckling on the elytra is confined to a little along the nerves, the other dark markings are much reduced, and the frons is brownish yellow, with a double black middle stripe and black or fuscous transverse lines. Length, 3—3½ mm.

Very abundant in grassy places. The male is easily recognised by its small size and dusky appearance, but the female is liable to be confounded with *A. communis*, from which it is best separated by its narrower, more pointed form, and the absence of milk-white spots on the elytra.

#### 8. *Athysanus obsoletus*, Kbm.

*Athysanus obsoletus*, Kirschb., Athys. Art., 7, 4;

Cicad., 109, 50; Scott, Ent. Mo. Mag., xii., 97, 7.

*A. sexpunctatus*, J. Sahl., Not. Fenn., xii., 271, 8.

*A. piceus*, Scott, Ent. Mo. Mag., xii., 97, 6.

Greyish yellow; crown with six black points placed in two oblique lines meeting in the apex. Crown in the male as long as half its basal width, two-thirds longer in the middle than at the sides; in the female a little longer than half its basal width, one-half longer in the middle than at the sides, its free sides gently arcuate, the angle obtuse; basal markings punctiform, close to the eyes; interocular line thickened and widely interrupted in the middle, most frequently represented by a pair of spots on the disc; interocellar line thickened and interrupted in the middle, often broken up into four spots, and most frequently represented by a pair of spots on the apex; infraocellar line obsolete or wanting. Frons yellow, with black transverse lines. Pronotum three times (♀) or nearly three times (♂) as long as the crown. Elytra variable in length, in the prevalent form with scarcely any traces of black speckling along the whitish nerves. Abdomen in the male black, with the connexivum yellow; in the female yellow, with an acuminate black middle stripe on both upper and under sides; hind margin of the last ventral segment (♀) concave, with a blunt triangular tooth in the middle. Legs striped and spotted with black; intermediate thighs with a black band before the apex. Length, 4½—5½ mm.

Very abundant in damp grassy places. Of the same robust build as *A. grisea*, but easily distinguished by the markings on the crown. The dark form (*A. picea*, Scott) has the frons black, with yellow transverse lines; the crown (by reason of the exaggeration and confluence of the normal markings) black, with a few yellow spots, or entirely black; and the pronotum, scutellum, and elytra lighter or darker pitch-brown, in the latter owing to the close black speckling, after the manner of *A. obscurellus*, male.

9. *Athysanus melanopsis*, Hardy.

*Aphrodes melanopsis*, Hardy, Trans. Tynes. Field Club, i., 427, 3.

*Thamnotettix melanopsis*, Scott, Ent. Mo. Mag., xii., 23, 4.

*T. Scotti*, Fieb., Cicad. d'Eur. (*Thamnotettix*), 66, 7.

Brownish yellow; areas of the elytra often narrowly margined with fuscous or black. Crown one-half longer than half its basal width, one-half longer in the middle than at the sides, its free sides nearly straight, angle distinct but obtuse; basal markings large, horseshoe-shaped; interocular line interrupted, but scarcely thickened in the middle, often broken up into four spots, on the hinder half of the disk a pair of whitish stripes narrowly margined with fuscous reaching as far as the interocular line; interocellar line broken up into four spots; infraocellar line biarcuate, very distinct. Frons black, with a middle stripe and the transverse lines yellow. Pronotum a little longer than the crown, sometimes with four wide dark stripes. Scutellum yellow, generally without markings. Elytra in the male a little longer, in the female a little shorter, than the abdomen, narrowly rounded at the apex, the areas frequently more or less distinctly ocellate, but very often without markings; nerves pale. Abdomen black; hind margins of the dorsal segments narrowly whitish behind. Last ventral segment (♀) a little longer than the preceding, its hind margin simple, very feebly concave. Legs black, the knees and the outer side of the tibiæ for some distance from the base brownish yellow. Length, 3 mm.

Widely distributed, but not very common. Easily distinguished by its small size and Deltocephaloid facies; it forms, in fact, a connecting link between the genera *Athysanus* and *Deltocephalus*, if we pass to the latter by way of *D. pulicaris*.

iii. DELTOCEPHALUS, *Burm.* (Pl. III., fig. 13).Burmeister, *Gen. Ins.*, ii. (1838).

Body oblong or elongate. Head with the eyes as wide as the pronotum, pointed in front; crown flat or slightly convex, more or less angularly produced in front; frons at the apex three or four times as wide as the temples; cheeks generally subangularly dilated; temples linear; ocelli somewhat distant from the eyes. Side margins of pronotum short. Elytra usually subcoriaceous, with five subapical areas, generally shorter than the abdomen with very short apical areas, sometimes longer than the abdomen in consequence of the development of the membrane and appendix, and in that case the elytra overlap a little at the apex. Wings often very short.

## TABLE OF SPECIES.

- |    |  |                         |
|----|--|-------------------------|
| 1  | (36). Crown flat or slightly depressed.  |                         |
| 2  | (35). Elytra without a black spot at the apex of the fourth subapical area.  |                         |
| 3  | (10). Elytra green, greyish green, or yellow (dark margins to the areas exceptional in this group).  |                         |
| 4  | (5). Corium opaque throughout; apical areas sometimes with dark hind margins ..  | 1. <i>abdominalis</i> . |
| 5  | (4). Corium never entirely opaque; elytra generally transparent.   |                         |
| 6  | (7). Frons with a wedge-shaped yellowish-white stripe reaching from the forehead to the clypeus .. .. .  | 2. <i>striifrons</i> .  |
| 7  | (6). Frons without a yellowish-white stripe.   |                         |
| 8  | (9). Genital plates reaching nearly three times as far as the valve; hind margin of the last ventral segment in the female concave, with a deep acutangular notch in the middle .. .. .      | 3. <i>pascuellus</i> .  |
| 9  | (8). Genital plates reaching only twice as far as the valve; hind margin of the last ventral segment in the female nearly straight ..  | 4. <i>citrinellus</i> . |
| 10 | (3). Species lighter or darker brownish yellow or greyish or ochreous white. Nerves frequently wholly or partly milk-white (dark margins to the areas of frequent occurrence in this group). |                         |
| 11 | (12). Clavus divided into several small areas ..   | 5. <i>ocellaris</i> .   |
| 12 | (11). Clavus not divided into small areas.   |                         |
| 13 | (30). ♂; genital plates not shorter than the valve: ♀; hind margin of the last ventral segment toothed or notched or triangularly produced.  |                         |

- 14 (15). Front margin of crown with four or six equidistant black spots, or a black band bearing three or five pale spots .. .. 6. *coronifer*.
- 15 (14). Crown not as above.
- 16 (29). ♂; side lobes of pygofer more or less pointed, not connivent: ♀; hind margin of the last ventral segment without a triangular notch in the middle.
- 17 (24). All or most of the areas of the elytra margined with fuscous.
- 18 (23). All the areas, including the basal one, margined with fuscous.
- 19 (20). Nerves concolorous .. .. 7. *repletus*.
- 20 (19). Nerves white.
- 21 (22). Fuscous margins of the areas regular .. 8. *oculatus*.
- 22 (21). Fuscous margins of the areas irregular .. 9. *picturatus*.
- 23 (18). Nearly all the areas, except the basal one, irregularly margined with fuscous .. 10. *Flori*.
- 24 (17). The fuscous markings of the elytra either confined to a narrow border to the apical areas, and one or two spots on the corium, or entirely wanting.
- 25 (26). Outline of the hind margin of the last ventral segment in the female resembling an ogee arch .. .. 11. *Linnei*.
- 26 (25). Not as above.
- 27 (28). Hind margin of the last ventral segment in the female with an angular notch on each side .. .. 12. *distinguendus*.
- 28 (27). Hind margin of the last ventral segment in the female feebly trisinate .. .. 13. *Falleni*.
- 29 (16). ♂; side lobes of pygofer wide, inflexed, and connivent: ♀; hind margin of the last ventral segment with a small triangular notch in the middle .. .. 14. *socialis*.
- 30 (13). ♂; genital plates very short, distinctly shorter than the valve: ♀; hind margin of the last ventral segment simple, faintly concave or straight.
- 31 (34). The three innermost apical areas not white.
- 32 (33). Elytra with five or six distinct black spots. Inhabits coast-sands .. .. 15. *sabulicola*.
- 33 (32). Elytra not spotted, the inner areas more or less bordered, sometimes entirely filled up with black or brown. Abundant everywhere .. .. 16. *striatus*.
- 34 (31). The costal and three innermost apical areas white .. .. 17. *Normani*.
- 35 (2). Elytra with a small black spot at the apex of the fourth subapical area .. .. 18. *punctum*.
- 36 (1). Crown distinctly though slightly convex.
- 37 (38). Elytra with two broad white bands .. 19. *argus*.
- 38 (37). Elytra not banded with white.

- 39 (40). Membrane with two distinct black spots, one  
in the first and the other in the fourth  
apical area . . . . . 20. *costalis*.
- 40 (39). Membrane without black spots.
- 41 (42). Front of crown with a black band bearing  
five white spots . . . . . 21. *coroniceps*.
- 42 (41). Crown not as above.
- 43 (44). Crown with two round black spots . . . . . 22. *maculiceps*.
- 44 (43). Crown without round black spots . . . . . 23. *pulicaris*.

### 1. *Deltocephalus abdominalis*, Fab.

*Cercopis abdominalis*, Fab., Sys. Rhyn., 98, 61.

*Cicada bicolor*, Fieb., Ent. Sys., iv., 40, 55.

*C. abdominalis*, Fall., Hem. Suec., ii., 31, 10; Zett.,  
Ins. Lapp., 290, 6.

*C. balteata*, Zett., Ins. Lapp., 290, 8.

*Jassus abdominalis*, Germ., Faun. Ins. Eur., xvii.,  
t. 19; H.-Scff., Deuts. Ins., 125, 4; Thoms.,  
Opusc., Ent., i., 66, 45.

*Aphrodes juvenca*, Hardy, Trans. Tynes. Field Club,  
i., 425, 2 (pars.).

*Deltocephalus abdominalis*, Flor, Rhyn. Liv., ii., 249, 9;  
Marsh., Ent. Mo. Mag., ii., 265, 9; Kirschb.,  
Cicad., 129, 89; Fieb., Syn. Eur. Delt., 15, 40,  
fig. 40; J. Sahl., Not. Fenn., xii., 328, 21; Scott,  
Ent. Mo. Mag., xii., 242, 6.

Upper side greenish yellow or greyish green; hind margins of the apical areas frequently fuscous. Crown distinctly shorter than its width at the base, nearly twice as long in the middle as at the sides, the free sides straight, angle blunt. Frons black, with yellow transverse lines; apical half sometimes yellow, with a double black middle stripe. Pronotum about one-third shorter than the crown, Elytra coriaceous, as long as or a little longer than the abdomen, widely rounded at the apex; membrane and the apices of the subapical areas whitish, subpellucid; nerves yellow. Legs yellow, striped, spotted, and banded with black; hind tarsi black, yellow at the base. ♂; abdomen black; genital plates separately rounded at the apex, their outer margin angularly excised on the apical third, their inner margin about one and a half times as long as the valve; pygofer reaching beyond the plates. ♀; abdomen above black, below yellow spotted with black; last ventral segment black, sides and hind margin more or less widely yellow, the latter with a longitudinally striate depression on each side and a pair of triangular teeth in the middle. Length, 4—4½ mm.

Not uncommon. Fieber's figure of the male genitalia seen from below, is not characteristic. J. Sahlberg speaks of red or reddish varieties of this species, but I have not seen British specimens of these.

## 2. *Deltocephalus striifrons*, Kbm.

*Deltocephalus striifrons*, Kirschb., Cicad., 139, 12;

J. Sahl., Not. Fenn., xii., 327, 20; Ferrari,  
Cicad. agri. Ligust. 72, 20, and 74, 154.

*D. Mulsanti*, Fieb., Syn. Eur. Delto., 16, 45, fig. 44;  
Scott, Ent. Mo. Mag., xii., 240, 2.

*D. longicaput*, Scott, Ent. Mo. Mag., xii., sec. spec. typ.

Oblong. Upper side bright yellow; three narrow stripes on the crown, five on the pronotum, and the basal half of the costa, white; a pair of short black lines on the apex of the crown. Crown in the male as long, in the female one-fourth longer, than its width at the base, about one-third longer in the middle than at the sides, the free sides nearly straight, angle pointed. Frons black, with whitish transverse lines, its central space occupied by a large whitish-yellow triangle, of the same width at the base as the clypeus, and reaching thence to the forehead; infraocellar line broad, gently curved, and very well-defined, interrupted in the middle, and joined to the two short lines on the apex of the crown which represent the interocellar line. Pronotum about one-third shorter than crown. Elytra about as long as the abdomen, coriaceous on the basal half, afterwards subpellucid; nerves whitish. Legs yellow, striped, banded, and spotted with black. ♂; abdomen black, sides and apex yellow; genital plates yellow, reaching as far as the pygofer, separately rounded at the apex, their inner margin at least two and a half times as long as the valve, each one bearing a longitudinal impressed line, which is subparallel with the outer margin. ♀; abdomen above yellow; a few of the basal segments black in the middle; under side yellow, with a wide black middle stripe, or entirely black; last ventral segment yellow, its hind margin semicircularly concave, with a deep narrow black-bordered angular notch in the middle. Length,  $3\frac{1}{2}$ — $3\frac{3}{4}$  mm.

Not common. Amongst *Ononis* on the south coast. According to Reuter it is found on *Trifolium*.

3. *Deltocephalus pascuellus*, Fall.

*Cicada pascuella*, Fallen, Hem. Suec., ii., 32, 11.

*Jassus pascuellus*, Thoms., Opusc. Ent., i., 70, 54.

*Deltocephalus pascuellus*, Flor, Rhyn. Liv., ii., 251, 10 ;  
Marsh., Ent. Mo. Mag., ii., 267, 11 ; Kirschb.,  
Cicad., 138, 108 ; Fieb., Syn. Eur. Delto., 16, 44,  
fig. 46 ; J. Sahl., Not. Fenn., xii., 325, 18 ; Scott,  
Ent. Mo. Mag., xii., 244, 9.

*D. luteolus*, Kirschb., Cicad., 138, 109.

*D. fuscognatus*, Dahl., Vet. Ak. Handl., 1850, 195.

*D. Minki*, Fieb., Syn. Eur. Delto., 17, 46, fig. 45 ;  
Scott, Ent. Mo. Mag., xii., 243, 8 ; Ferrari,  
Cicad. agri. Ligust., 72, 21.

Elongate. Upper side pale yellow; apical areas and those adjoining frequently margined with fuscous; costa yellowish white; interocellar line represented by two or four black or fuscous spots. Crown in the male as long, in the female a little longer, than its width at the base, about one-third longer in the middle than at the sides, free sides distinctly arcuate, angle blunt. Frons black or brown, with a few curved transverse whitish lines down each side; infraocellar line represented by a black V near the middle of the forehead, the ends of which sometimes merge into the ground colour of the frons. Pronotum very little shorter than the crown. Elytra subpellucid, a little longer than the abdomen in the male, a little shorter in the female, widely rounded at the apex; nerves yellow. Legs pale yellow, striped, spotted, and banded with black. ♂; abdomen black, sides and apex yellow; genital plates yellow, basal half black, long, triangular, separately rounded at the apex, their inner margin rather more than twice as long as the valve; on the basal two-thirds of each a longitudinal impressed line. ♀; abdomen coloured as in *D. striifrons*; hind margin of the last ventral segment gently concave, with a deep angular notch in the middle. Length, 3—3½ mm.

Very common amongst grasses in damp places. Judging from a type received from Dr. Puton, this is clearly *D. Minki*, Fieb., and if we imagine the processes of the lower margins of the male pygofer to be half sagittate at the apex instead of simple, Fieber's figure (*l. c.*, fig. 45, *e*) would well represent that portion of our insect. I have taken both sexes on July 2nd, and immature examples and nymphs as late as Sept. 30th.

4. *Deltocephalus citrinellus*, Kbm.

*Deltocephalus citrinellus*, Kirschb., Cicad., 134, 100 ;

J. Sahl., Not. Fenn., xii., 334, 25.

*Jassus cephalotes*, H.-Scff., Deuts. Ins., 125, 6.

*Deltocephalus cephalotes*, Ferrari, Cicad. agri. Ligust., 72, 19.

*D. assimilis*, Fieb., Syn. Eur. Delto., 16, 43, fig. 41 ;

Scott, Ent. Mo. Mag., xii., 243, 7.

*D. brachynotus*, Fieb., l. c., 19, 55, fig. 55.

Oblong-ovate. Upper fore parts greenish yellow, elytra pale greyish green, breast black. Crown subequal in length to its width at the base, nearly twice as long in the middle as at the sides, free sides nearly straight, angle blunt; intercellar line when present fuscous. Frons pale brown, with a middle stripe and the usual side lines yellow. Pronotum about one-third shorter than the crown. Elytra whitish hyaline at the apex, a little longer than the abdomen, costa rounded, apex widely rounded; nerves stout, yellow, inner apical areas and those adjoining sometimes narrowly margined with fuscous. Legs yellow, striped and spotted with black. ♂; abdomen black; genital plates very small, separately rounded, scarcely half as long as the trapeziform valve. ♀; abdomen black, with the sides more or less widely yellow; last ventral segment yellow at the sides or entirely yellow, its hind margin nearly straight. Length, 2 $\frac{3}{4}$ —3 $\frac{1}{4}$  mm.

Moderately common amongst grasses in damp places.

5. *Deltocephalus ocellaris*, Fall.

*Cicada ocellaris*, Fall., Hem. Suec., ii., 33, 13; Zett., Ins. Lapp., 291, 11.

*Jassus ocellatus*, H.-Scff., Deuts. Ins., 129, 11; Germ., Faun. Ins. Eur., xvii., 18.

*Deltocephalus ocellaris*, Flor, Rhyn. Liv., ii., 237, 3; Marsh., Ent. Mo. Mag., ii., 223, 2; Kirschb., Cicad., 141, 115; Thoms., Opusc. Ent., i., 72, 59; Fieb., Syn. Eur. Delto., 5, 9, fig. 9; J. Sahl., Not. Fenn., xii., 310, 7; Scott, Ent. Mo. Mag., xii., 275, 16; Ferrari, Cicad. agri. Ligust., 70, 4.

Crown yellowish white with fulvous spots, in the male as long, in the female a little longer, than its basal width, about three-fourths longer in the middle than at the sides, free sides feebly arcuate, angle blunt. Frons blackish brown, sometimes with a large yellow patch on the apical half; side lines short, whitish.

Pronotum one-third or less shorter than the crown, fulvous, with three or five narrow yellowish white stripes. Scutellum yellowish white, with fulvous spots. Elytra dirty yellow, obliquely subtruncate at the apex; nerves white, the transverse ones and those at the base and apex of the first subapical area dilated; clavus divided into several small areas, which, together with those of the corium and membrane, are margined with black. Abdomen black, yellow at the apex. Legs: thighs black, yellow at the apex; tibiae yellow with black points, hind pair widely black on the inner side. ♂; elytra somewhat longer than the abdomen; genital plates elongate, triangular, reflexed, subnavicular, with a common narrow oval impression at the apex. ♀; elytra shorter than the abdomen; hind margin of the last ventral segment with a strong triangular, sometimes bifid, tooth in the middle. Length, 3—3½ mm.

Very abundant amongst grasses.

#### 6. *Deltocephalus coronifer*, Marsh.

*Deltocephalus coronifer*, Marsh., Ent. Mo. Mag., ii., 265, 8.

*Thamnotettix coronifer*, Scott, Ent. Mo. Mag., xii., 24, 8; Ferrari, Cicad. agri. Ligust., 51, 11, and 54, 122; Fieb., Cicad. d'Eur. (*Thamnotettix*), 69, 9.

Brownish yellow. Crown distinctly longer than the pronotum, about twice as long in the middle as at the sides, nearly as long as its basal width; infraocellar line complete, biarcuate, and combining with the interocellar line to form a black band bearing three or five pale spots; cheeks black, with a few pale spots; frons pale, with a few black transverse lines. Elytra about as long as the abdomen, the areas margined with fuscous feebly at the base, more strongly towards the apex; a blackish spot in the base of the third subapical area; nerves white, those at the base and apex of the first subapical area not thickened; one transverse nerve. Basal half of the abdomen blackish. Legs pale, distinctly spotted with black. Length, 3 mm.

Amongst grass beneath furze-bushes at Esher, in September. The above description is taken from the Rev. T. A. Marshall's original examples. I have seen no recent specimens.

7. *Deltocephalus repletus*, Fieb.

*Deltocephalus repletus*, Fieb., Syn. Eur. Delto., 8, 20, fig. 20; Scott, Ent. Mo. Mag., xviii., 66; Ferrari, Cicad. agri. Ligust., 70, 9.

Narrow, parallel-sided. Crown one-third longer than its basal width, twice as long in the middle as at the sides, free sides feebly arcuate, angle pointed; yellow-brown becoming whitish in front, four spots representing the interocellar line and two on the disk fuscous or blackish. Frons blackish brown, the side lines and sometimes a middle stripe on the lower half yellowish. Pronotum one-third shorter than the crown, yellow-brown, with three or five more or less distinct linear white stripes, sometimes with a blackish spot on each side. Elytra yellow-brown, much longer than the abdomen, the membrane well-developed, all the areas regularly margined with fuscous; nerves concolorous, the dilated ones at the base and apex of the first subapical area and the apices of those in the clavus scarcely whitish. Abdomen black, upper side more or less widely yellow at the apex. Legs brownish yellow, striped, spotted, and banded with black.

Scarce. Forres (*Norman*); I have taken it singly in three localities in Norfolk.

8. *Deltocephalus oculus*, J. Sahl.

*Deltocephalus oculus*, J. Sahl., Not. Fenn., xii., 308, 6; Scott, Ent. Mo. Mag., xii, 274, 15.

Narrow, parallel-sided; eyes large and prominent. Upper side yellowish; a short oblique line on each side of the apex of the crown, the hind part of the disc of the pronotum, some markings on the scutellum, and wide margins to the areas of the elytra, fuscous. Crown strongly angularly produced, nearly twice as long in the middle as at the sides. Eyes one-fifth longer than half the front margin of the crown. Frons blackish brown, with very short pale side-lines; clypeus yellow, with a fuscous middle stripe. Pronotum somewhat shorter than the crown. Elytra shining, somewhat longer than the abdomen, elongate, parallel-sided, obtusely rounded at the apex, the strongly thickened nerves and two spots on the suture white; all the areas widely margined with fuscous. Abdomen black, its sides and the margins of the segments yellow. Legs yellow, spotted and striped with fuscous. Length,  $3\frac{1}{2}$  mm.

Rare. One or two examples in Scott's collection, labelled by J. Sahlberg. Evidently closely allied to the preceding form, from which it is mainly distinguished by its white nerves.

#### 9. *Deltocephalus picturatus*, Fieb.

*Deltocephalus picturatus*, Fieb., Syn. Eur. Delto., 9, 23, fig. 23; Ferrari, Cicad. agr. Ligust., 71, 11, and 73, 151.

Narrow, parallel-sided. Crown one-third longer than its basal width, twice as long in the middle as at the sides, free sides nearly straight, angle pointed; white, with large blotches of pale rust-brown, the interocellar line broken up into four blackish lines. Frons blackish brown, the apex narrowly, a fine linear middle stripe on the lower half, and the side-lines, whitish. Pronotum about one-third shorter than the crown, pale brown, with three or five linear white stripes, and sometimes a blackish spot on each side. Elytra yellow-brown, much longer than the abdomen, the membrane well-developed, all the areas strongly and irregularly margined with fuscous, the basal one filled up with that colour; nerves milk-white, strongly and irregularly dilated; the sentellar margin and two roundish spots at the apices of the nerves of the clavus white. Abdomen black, upper side yellow at the apex. Legs greyish yellow, striped, banded, and spotted with black. Length, ♂—3½ mm.

Scarce. Pitlochry, Perthshire; Dunston Common, near Norwich.

#### 10. *Deltocephalus Flori*, Fieb.

*Deltocephalus Flori*, Fieb., Syn. Eur. Delto., 10, 25, fig. 25; Scott, Ent. Mo. Mag., xviii., 67; Ferrari, Cicad. agr. Ligust. 71, 12.

Crown a little longer than its basal width, about twice as long in the middle as at the sides, free sides nearly straight, angle pointed; white, with some large rust-yellow blotches occupying almost all the disc. Frons blackish brown, a linear middle stripe on the lower half, the apex narrowly and the subclavate side-lines whitish. Pronotum one-third or more shorter than the crown, rust-yellow, with five linear white stripes. Elytra brownish yellow, subequal in length to the abdomen, widely rounded at the apex; membrane well-developed; areas with the exception,

generally, of the costal, subcostal, and basal, feebly and irregularly margined with fuscous; nerves milk-white, the transverse ones, the apices of those in the clavus, and those at the base and apex of the first subapical area much dilated. Abdomen black, upper side more or less widely yellow at the apex. Legs greyish yellow, banded, striped, and spotted with black. Length, 3 mm.

Amongst long grass in woods, &c.; not very common.

### 11. *Deltocephalus Linnei*, Fieb.

*Deltocephalus Linnei*, Fieb., Syn. Eur. Delto., 14, 35, fig. 35.

*D. l-album*, Scctt, Ent. Mo. Mag., xviii., 137 (orig.).

Crown a little longer than its basal width, nearly twice as long in the middle as at the sides, free sides feebly arcuate, angle pointed; yellowish white, with some rust-yellow blotches. Frons black, its lower half and the usual transverse side-lines yellow. Pronotum about one-third shorter than the crown, rust-yellow, with five more or less distinct linear white stripes. Elytra pale brownish yellow, as long or longer than the abdomen, some of the areas, especially on the apical half, narrowly margined with fuscous; nerves milk-white, the first transverse nerve much thickened. Legs yellow, striped, spotted, and banded with black. ♂; pygofer reaching a little beyond the genital plates, the inner margin of the latter about twice as long as the valve. ♀; abdomen black, apical half yellow, outline of the hind margin of the last ventral segment resembling an ogee arch. Length, 4—4½ mm.

Rare. Near Hastings.

### 12. *Deltocephalus distinguendus*, Flor.

*Deltocephalus distinguendus*, Flor, Rhyn. Liv., ii., 240; Fieb., Syn. Eur. Delto., 9, 21, fig. 21; Scott, Ent. Mo. Mag., xviii., 67; Ferrari, Cicad. agri Ligust., 70, 10.

*D. pseudocellaris*, Flor, l. c., 547; Thoms., Opusc. Ent., i., 73, 61; J. Sahl., Not. Fenn., xii., 314, 10.

*D. propinquus*, Edwards, Ent. Mo. Mag., xx., 208 (nec Fieb.).

Crown a little longer than its basal width, twice as long in the middle as at the sides, free sides straight, angle pointed; yellow, sometimes with two brown patches on the disc; interocellar line represented by a point at each ocellus, and a pair of short oblique

lines on the apex of the crown. Pronotum little more than half as long as the crown, yellow, with three or five more or less distinct linear white stripes. Scutellum yellow. Elytra greyish yellow, as long or a little longer than the abdomen, subtruncate at the apex, their hind margin, the apical half of the costa, and some of the areas narrowly margined with fuscous or black; nerves white, but, with the exception of the dilated ones at the base and apex of the first subapical area, not conspicuously milk-white. Abdomen black, more or less widely yellow at the apex. Legs yellow, with black points and linear stripes and bands. ♂; genital valve short, triangular, one-half longer than the last ventral segment; plates reflexed, elongate-triangular, three times as long as the valve, outer margins sinuate, apices separately rounded; side lobes of the pygofer much shorter than the plates, and somewhat shorter than the anal tube, in the middle of the lower margin a strong tooth. ♀; last ventral segment twice as long as the preceding, with an angular notch on each side, middle lobe wide, subtrapeziform, side lobes triangular, shorter than the middle one. Length,  $2\frac{3}{4}$ —3 mm.

With the exception, perhaps, of *D. striatus*, this is the commonest species of the genus with us. The notches in each side of the hind margin of the last ventral segment of the female are subject to much variation in degree, and in those examples where they are least developed the hind margin appears to bear two small triangular teeth, which are about equidistant from the sides and from each other.

### 13. *Deltocephalus Falleni*, Fieb.

*Deltocephalus Falleni*, Fieb., Syn. Eur. Delto., 10, 24, fig. 24; J. Sahl., Not. Fenn., xii., 315, 11; Scott, Ent. Mo. Mag., xii., 271, 11.

Scarcely distinguishable from the preceding, except by the characters of the genitalia. ♂; genital plates reflexed, three times as long as the valve, sinuate on their outer margin, and obtusely rounded at the apex; side lobes of pygofer scarcely shorter than the anal tube, but somewhat shorter than the plates, a small incurved tooth at the apex, and a strong tooth in the middle of the lower margin. ♀; last ventral segment nearly twice as long as the preceding, its hind margin feebly trisinate, the intermediate sinus wider and not so deep as the lateral ones, the lateral angles somewhat obtuse. Length,  $2\frac{3}{4}$ —3 mm.

Widely distributed, but not common. There seems to be room for considerable doubt whether this species is really distinct from the preceding.

#### 14. *Deltocephalus socialis*, Flor.

*Deltocephalus socialis*, Flor, Rhyn. Liv., ii., 242, 5; Marsh., Ent. Mo. Mag., ii., 250, 4; Kirschb., Cicad., 143, 118; Fieb., Syn. Eur. Delto., 5, 8, fig. 8; J. Sahl., Not. Fenn., xii., 312, 8; Scott, Ent. Mo. Mag., xii., 273, 14; Ferrari, Cicad. agri Ligust., 69, 3.

*D. quadrivittatus*, Marsh., l. c., 221, 1.

*Jassus socialis*, Thoms. Opusc. Ent., i., 73, 60.

Crown a little longer than its basal width, nearly twice as long in the middle as at the sides, free side very feebly arcuate, angle blunt; white, with rust-yellow blotches; interocellar line represented by a point near each ocellus, and a pair of triangular black spots on the apex. Frons brown, the side-lines, a middle stripe on the lower half, and the apex, yellow. Pronotum one-third to one-half shorter than the crown, pale brown, with five linear white stripes. Elytra dirty yellow, shorter than the abdomen, widely rounded at the apex; nerves white, but not anywhere dilated, the areas, especially towards the apex, faintly margined with fuscous. Abdomen above yellow, its basal half, a linear stripe down each side, and some traces of a double line down the middle, black; upper side of the pygofer in the male with a large roundish black spot on each side. Legs yellow, with black points and narrow black bands and stripes. ♂; genital plates rather more than twice as long as the valve, yellow, each bearing a large black patch at its separately rounded apex; lateral lobes of the pygofer inflexed, connivent. ♀; hind margin of the last ventral segment rather strongly concave, with a small angular black-bordered notch in the middle, not reaching half the length of the segment. Length,  $2\frac{3}{4}$ —3 mm.

Widely distributed, but local. In the macropterous form all the areas of the elytra are more or less broadly margined with black.

#### 15. *Deltocephalus sabulicola*, Curt.

*Aphrodes sabulicola*, Curt., Brit. Ent., p. and pl. 633.

*Deltocephalus sabulicola*, Marsh., Ent. Mo. Mag., ii., 251, 7; Fieb., Syn. Eur. Delt., 12, 29, fig. 29; Scott, Ent. Mo. Mag., xii., 272, 12.

*D. arenicola*, J. Sahl., Not. Fenn., xii., 343, 32.

Crown distinctly shorter than its basal width, about one-half longer in the middle than at the sides, free sides feebly arcuate, angle blunt; yellowish white, the markings when present rust-brown, ill-defined, and frequently coalescent. Frons pale brown, the lower half and the side-lines yellowish white. Pronotum a little shorter than the crown, pale brown, with three or five linear white stripes. Elytra much longer than the abdomen, greyish yellow, with a few isolated black spots, of which the following are the most constant, *viz.*, one on the basal third of the clavus next the claval suture, one at the base of the supra-brachial area, and one at the apex of the third subapical area, inner margin of the clavus, except the basal third, narrowly black, and the third apical area more or less filled up with the same colour; nerves milk-white, the transverse ones dilated. Abdomen black, sides and apex more or less widely yellow. Legs greyish yellow, with a few black points. Genitalia very similar to those of the next species. Length, 4 mm.

Very common on coast-sands.

16. *Deltocephalus striatus*, Lin.

*Cicada striata*, Lin., Faun. Suec., ed. ii., 241, 887; Schrank, Enum. Ins. Aust., 256, 492; Fab., Sys. Rhyn., 77, 74; Fall., Hem. Suec., ii., 35, 17; Zett., Ins. Lapp., 291, 13.

*Jassus striatus*, H.-Schf., Deuts. Ins., 130, 10; Thoms., Opusc. Ent., i., 70, 53.

*J. strigatus*, Germ., Mag. d'Ent., iv., 92, 33.

*Deltocephalus striatus*, Flor, Rhyn. Liv., ii., 259, 14; Marsh., Ent. Mo. Mag., ii., 250, 5; Kirschb., Cicad., 132, 96; Fieb., Syn. Eur. Delt., 13, 32, fig. 32; J. Sahl., Not. Fenn., xii., 339, 28; Scott, Ent. Mo. Mag., xii., 272, 13; Ferrari, Cicad. agri Ligust., 71, 16, and 74, 153.

Crown and pronotum as in *D. sabulicola*. Frons brown, the apex narrowly, a linear middle stripe, and the side-lines, whitish. Elytra greyish yellow, much longer than the abdomen, the areas of the inner half more or less distinctly margined with fuscous, the third apical area frequently filled up with the same colour; nerves white, the transverse ones not conspicuously dilated. Abdomen black, sometimes yellow at the sides and apex. Legs greyish yellow, with some black points; hind tibiae narrowly striped with black. ♂; genital plates very small and short,

separately pointed, less than half as long as the trapeziform genital valve. ♀; hind margin of the last ventral segment simple, feebly concave. Length,  $3\frac{1}{4}$ — $3\frac{1}{2}$  mm.

Very abundant amongst grasses in a variety of situations. Varieties in which the inner areas of the elytra are entirely filled up with black are not uncommon. The salt-marsh form is smaller, with the elytra scarcely as long as the abdomen, and hardly any traces of dark margins to the areas.

### 17. *Deltocephalus Normani*, Scott.

*Deltocephalus Normani*, Scott, Ent. Mo. Mag., xviii., 105.

♂. Closely allied to *D. striatus*, to the pale forms of which it bears a very great resemblance. Upper side very pale yellow-brown, a stripe down the middle of the crown and pronotum, and the costal and three innermost apical areas, white. Elytra as long as the abdomen. The genital valve and plates are like those of *D. striatus*, save that the apices of the latter in the original example are a trifle more oblique within. ♀; elytra shorter than the abdomen; nerves of the clavus dark brown. Length,  $3$ — $3\frac{1}{2}$  mm.

“High heathery land in Morayshire” (one male, two females). The shape of the last ventral segment in the female is undescribed, and I have not been able to examine a specimen of that sex. The insect is probably one of the many forms of *D. striatus*.

### 18. *Deltocephalus punctum*, Flor.

*Deltocephalus punctum*, Flor, Rhyn. Liv., ii., 247, 8; Marsh., Ent. Mo. Mag., ii., 251, 6; Kirschb., Cicad., 146, 25; J. Sahl., Not. Fenn., xii., 320, 14; Scott, Ent. Mo. Mag., xii., 271, 10.

*D. costalis*, Fieb., Syn. Eur. Delt., 4, 4, fig 4.

Crown almost one-third longer than its basal width, nearly twice as long in the middle as at the sides, free sides straight, angle pointed; yellowish grey with three linear white stripes, interocellar line represented by a very fine fuscous line on each side of the apex. Frons yellowish grey, the interstices of the white side-lines brown. Pronotum about one-half as long as the crown, yellowish grey, with five linear white stripes. Elytra whitish hyaline,

shorter than the abdomen, apical areas short, narrowly margined with fuscous, in the apex of the fourth subapical area a black or fuscous spot, nerves white, not anywhere dilated. Abdomen greyish yellow, upper side near the base and the chief part of the under side black; upper side of the pygofer in the female with a rounded black spot on each side of the base. Legs greyish yellow, with a few black points. Length,  $2\frac{1}{4}$ — $2\frac{1}{2}$  mm.

Not uncommon amongst fine grasses in dry situations. The macropterous form has the elytra longer than the abdomen, with ample membrane and the hind margin of the apical areas broadly fuscous.

### 19. *Deltocephalus Argus*, Marsh.

*Deltocephalus Argus*, Marsh., Ent. Mo. Mag., ii., 223, 3; Fieb., Syn. Eur. Delt., 7, 17, fig. 17; Scott, Ent. Mo. Mag., xii., 276, 18.

Upper side brownish yellow; elytra with two broad white bands, one before and the other behind the middle; base of the supra-brachial area filled up with black. Crown subequal in length to its basal width, nearly twice as long in the middle as at the sides, free sides distinctly arcuate, angle blunt; basal markings subannular, interocular line represented by a point near each eye and two short lines placed end to end on the disc, interocellar line broken up into four spots, infraocellar line biarcuate, distinct. Frons black, with yellowish side lines, sometimes with a middle stripe on the lower half, and the apex yellowish. Pronotum slightly longer than the crown, yellow-brown, with three or five linear whitish stripes. Scutellum whitish, with some dusky markings at the base. Elytra longer than the abdomen, feebly rounded at the sides, nerves white, areas generally narrowly margined with fuscous. Abdomen black. Legs pale, banded, striped, and spotted with black. ♂; genital valve very small and short, almost semicircular, not half so long as the separately rounded plates, which scarcely reach half so far as the pygofer. ♀; hind margin of the last ventral segment simple, almost semicircularly concave. Length, 3— $3\frac{1}{2}$  mm.

Amongst grasses; widely distributed, but rare.

20. *Deltocephalus costalis*, Fall.

*Cicada costalis*, Fall., Hem. Suec., ii., 32, 12.

*Jassus costalis*, Thoms, Opusc. Ent., i., 69, 52.

*Deltocephalus bipunctipennis*, Boh., Sv. Ak. Handl., 1845, 261, 51; Fieb., Syn. Eur. Delt., 3, 1, fig. 1; J. Sahl., Not. Fenn., xii., 348, 35.

Elongate; upper side white, elytra towards the apex pale reddish brown, a deep black roundish spot in the first and fourth apical areas. Crown without markings, subequal in length to its basal width, about one-third longer in the middle than at the sides, free sides strongly arcuate, angle blunt. Face, breast, and legs white, the latter with some black points. Pronotum as long as the crown. Elytra parallel-sided, longer than the abdomen, the apex subtruncate; nerves white. Abdomen yellow, more or less marked with black in the middle towards the base both above and below. ♂; genital plates at least three times as long as the valve, with a large common roundish black spot in the middle. ♀; hind margin of the last ventral segment nearly straight, with an angular black-bordered notch in the middle. Length, 3—3½ mm.

Marshes, Ranworth, Sept. 30th, 1886. This is its first record as a British species.

21. *Deltocephalus coroniceps*, Kirschb.

*Deltocephalus coroniceps*, Kirschb., Cicad., 126, 84.

*Thamnotettix coroniceps*, Fieb., Cicad. d'Eur. (*Thamnotettix*), 70, 10.

♂. Upper side dirty greyish yellow, with some ill-defined whitish markings on the crown, pronotum, and scutellum; forehead and temples with a black band bearing about nine equidistant whitish spots, of which each ocellus forms one; frons with a few irregular blackish transverse curved lines. Crown a trifle shorter than its basal width, one-half longer in the middle than at the sides, free sides feebly arcuate, angle blunt. Pronotum subequal in length to the crown. Elytra longer than the abdomen; membrane amplé; nerves whitish, feebly and irregularly margined with fuscous. Abdomen pale, with black markings. Genital valve very widely rounded, about half as long as the preceding segment; plates large and wide, their joint outline almost semi-circular, and their inner margin rather more than twice as long as the valve. Length, 3½ mm.

Coxford Heath, Norfolk; one example, August, 1887. This insect is clearly a *Deltocephalus* of the *argus* group; it has nothing in common with *D. coronifer*, Marsh., next to which it is placed by Fieber in the genus *Thamnotettix*, except the pattern on the forehead.

### 22. *Deltocephalus maculiceps*, Boh.

*Deltocephalus maculiceps*, Boh., Sv. Ak. Handl., 1847, 25, 2; Marsh., Ent. Mo. Mag., ii., 267, 12; Kirschb., Cicad., 124, 80; Fieb., Syn. Eur. Delt., 18, 50, fig. 53; J. Sahl., Not. Fenn., xii., 350, 37; Scott, Ent. Mo. Mag., xii., 241, 4.  
*Jassus maculiceps*, Thoms., Opusc. Ent., i., 74, 63.

Oblong-ovate; upper side dirty greyish yellow, crown with two large roundish black spots in front. Crown as long or shorter than its basal width, about one-third longer in the middle than at the sides, free sides distinctly arcuate, angle very blunt. Frons blackish, with the upper part and the side-lines pale. Pronotum distinctly, sometimes almost one-third, shorter than the crown. Elytra subpellucid, rounded at the sides. Abdomen black, upper side at the apex more or less widely yellow in the female. Legs pale, base of the thighs marked with black, hind tibiæ black, except at the base. ♂; genital plates about three times as long as the valve, their outline paraboloid; elytra much longer than the abdomen. ♀; last ventral segment black, with a subquadrate greyish yellow spot in the middle of its hind margin, or greyish yellow with a pair of wide black stripes converging towards the base; the outline of its hind margin forms two large rounded lobes, separated by a short straight line. Length, 2½ mm.

Not common; my specimens were taken amongst low plants on the more bare parts of a wet heath near Norwich. In highly-coloured examples the costa and inner margin of the elytra are narrowly black, the nerves are brown, and the interocellar line is represented by a pair of black points on the apex of the crown.

### 23. *Deltocephalus pulicaris*, Fall.

*Cicada pulicaris*, Fall., Hem. Succ., ii., 34, 15; Zett., Ins. Lapp., 291, 12.  
*Jassus pulicaris*, H.-Seff., Deuts. Ins., 127, 4; Thoms., Opusc. Ent., i., 74, 64.

*Deltocephalus pulicaris*, Flor, Rhyn. Liv., ii., 266, 18 ;  
Marsh., Ent. Mo. Mag., ii., 268, 13 ; Kirschb.,  
Cicad., 124, 79 ; J. Sahl., Not. Fenn., xii., 351,  
38 ; Scott, Ent. Mo. Mag., xii., 275, 17 ; Ferrari,  
Cicad. agri Ligust., 71, 13 and 73, 152.

*D. pulicarius*, Fieb., Syn. Eur. Delt., 11, 27, fig. 27.

Oblong-ovate ; upper side pale brown, under side and legs black, knees and front tibiae brownish yellow. Crown in the male as long as, in the female shorter than, its basal width, twice as long in the middle as at the sides, free sides strongly arcuate, angle very blunt ; brownish yellow, variously spotted with fuscous or black, or entirely brownish yellow ; in well-marked examples the basal markings are present, the interocular line is represented by a pair of black spots on the disc, the interocellar line by two or four black spots, and the infraocellar line is biarcuate. Frons black, with or without a few brownish yellow transverse lines. Pronotum one-third or more shorter than the crown, frequently blackish on the hinder half. Elytra about two-thirds as long as the abdomen, widely rounded behind, apical areas extremely short, supra-brachial area and those adjoining filled up or at least margined with fuscous ; not unfrequently the costa is dark fuscous, and all the areas except the costal are filled up with that colour ; nerves pale, the transverse ones white. ♂ ; abdomen black, hind margin of the genital valve white, genital plates about three times as long as the valve, their outer margin slightly sinuate just before the apex. ♀ ; abdomen black, hind margin of the last dorsal segment white, hind margin of the last ventral segment forming three rounded lobes, of which the middle one is less than half as large as either of the others. Length, 2—2½ mm.

Very common amongst grasses in damp places.

iv. ALLYGUS, *Fieb.* (Pl. III., fig. 21).

Fieber, Cicad. d'Eur., part i., 123 (1876).

Body oblong, widest across the middle. Crown somewhat convex, with the eyes as wide as the pronotum, evenly rounded in front, not or scarcely longer in the middle than at the sides. Side margins of pronotum sharp, of moderate length, hinder angles obliquely truncate. Elytra convolute at the apex, much longer than the abdomen, with several irregularly-disposed white transverse nerves ; appendix ample.

The species of this genus are all very much alike in

facies, but may readily be distinguished by the characters of the genitalia. A valuable notice of these insects, with figures of details, will be found in the 'Cicadina agri Ligustici' of Dr. P. M. Ferrari, p. 60, et seq. (*Jassus*).

TABLE OF SPECIES.

- 1 (2). ♂; genital plates a little shorter than the valve.  
♀; last ventral segment somewhat shorter  
than the preceding .. .. . 1. *commutatus*.
- 2 (1). ♂; genital plates much longer than the valve.  
♀; last ventral segment much longer than  
the preceding.
- 3 (4). Crown with an oblique dark line running in-  
wards from the front margin of each eye .. 2. *modestus*.
- 4 (3). Crown without any oblique dark line .. .. 3. *mixtus*.

1. *Allygus commutatus*, Fieb.

*Allygus commutatus*, Fieb., Kat. der Eur. Cicad. (1872),  
p. 13; Scott, Ent. Mo. Mag., xii., 171, 2.

*Jassus atomarius*, Flor, Rhyn. Liv., ii., 326, 5;  
Kirschb., Cicad., 83, 2; Thoms., Opusc. Ent., i.,  
47, 3.

*J. commutatus*, Ferrari, Cicad. agri Ligust., 60, 3, and  
fig., p. 63.

*Thamnotettix reticulata*, J. Sahl., Not. Fenn., xii.,  
210, 2.

♂. Genital valve as long as the preceding segment, rounded-triangular; plates shorter than the valve, separately rounded-triangular, and leaving uncovered a piece of the apices of the styles about equal in length to the genital valve; the styles, when viewed from below, appear as two narrow horn-like processes converging at the apex; their real form, which is determinable when viewed from the side is that of a recumbent letter Y, having the upper arm the longer. ♀; last ventral segment a little shorter than the preceding, its hind margin nearly even, with a very feeble arcuate notch in the middle; the lateral angles rounded. Length, 6½ mm.

Rare. Tintern (*T. V. Wollaston*); Norwich, August, 1887, one female beaten out of an elm fence.

2. *Allygus modestus*, Fieb.

*Allygus modestus*, Fieb., Kat. der Eur. Cicad. (1872), p. 13; Scott, Ent. Mo. Mag., xii., 171, 3; Ferrari, Cicad. agri Ligust., 61, 6 and 65, 143, fig., p. 66.  
*Jassus atomarius*, Marsh., Ent. Mo. Mag., 84, 22.

Crown with the basal markings punctiform, the interocular line is represented by a fine straight line running obliquely inwards from the front angle of each eye half-way to the base, and the interocellar line by a punctiform spot adjoining each ocellus. ♂; genital plates triangular, about three times as long as the triangular genital valve, completely covering the styles. ♀; last ventral segment much longer than the preceding, its hind margin with a very feeble angular notch in the middle; lateral angles much produced. Length, 7 mm.

Widely distributed, but much less common than the next species.

3. *Allygus mixtus*, Fab.

*Cicada mixta*, Fab., Ent. Sys., iv., 39, 54.

*C. reticulata*, Fall., Hem. Suec., ii., 40, 24, β.

*Jassus mixtus*, Fab., Sys. Rhyn., 86, 7; Germ., Mag. d'Ent., iv., 82, 7; Burm., Handb., ii., 111, 2; Flor, Rhyn. Liv., ii., 322, 4; Marsh., Ent. Mo. Mag., iii., 83, 21; Kirschb., Cicad., 84, 3; Thoms., Opusc. Ent., i., 47, 2; Ferrari, Cicad. agri Ligust., 61, 7 and 67, 144, fig.

*J. reticulatus*, H.-Seff., Deuts. Ins. 130, 11.

*Thamnotettix mixta*, J. Sahl., Not. Fenn., xii., 209, 1.

*Allygus mixtus*, Scott, Ent. Mo. Mag., xii., 170, 1.

Crown with the basal markings obsolete, the interocular line represented by a punctiform spot on each side of the disc, and the interocellar line by four punctiform spots. ♂; genital plates triangular, more than twice as long as the triangular genital valve, completely covering the styles. ♀; last ventral segment more than twice as long as the preceding, its hind margin nearly straight; the lateral angles not produced. Length, 6½—7 mm.

Common on oaks. This is a very variable species in the matter of the black speckling of the elytra; sometimes this is very scanty, and at others is so much exaggerated and confluent that the elytra appear deep black with white transverse nerves; immature examples have the upper fore parts tinged with green.

## v. THAMNOTETTIX, Zett. (Pl. III., fig. 15).

Zetterstedt, Ins. Lapp., 292 (1840).

Body oblong, widest in the middle. Crown somewhat convex, with the eyes about as wide as the pronotum, distinctly produced in front. Frons longer than wide. Pronotum obtusely rounded in front, side margins sharp, of moderate length, hind angles obliquely truncate. Elytra much longer than the abdomen, widened in the middle, overlapping or even convolute at the apex; appendix ample.

## TABLE OF SPECIES.

- |  |                         |
|--|-------------------------|
| 1 (18). Elytra broadly rounded at apex.  |                         |
| 2 (13). Side margin of frons from base of antenna to base of clypeus distinctly shorter than the width of the frons between the antennæ.   |                         |
| 3 (12). One transverse nerve standing on the brachial nerve.   |                         |
| 4 (9). Elytra not speckled with black.   |                         |
| 5 (6). Upper side dirty greenish yellow or greyish green, with or without a reddish tinge on the crown, pronotum, and scutellum ..   | 1. <i>prasina</i> .     |
| 6 (5). Upper side greyish yellow or yellow-brown.  |                         |
| 7 (8). Elytra greyish yellow .. .. .   | 2. <i>dilutior</i> .    |
| 8 (7). Elytra yellow-brown .. .. .   | 3. <i>subfuscula</i> .  |
| 9 (4). Elytra greyish yellow, speckled with black.   |                         |
| 10 (11). Frons with two large black spots above, each formed by the confluence of about three short transverse lines .. .. .   | 4. <i>variegata</i> .   |
| 11 (10). Frons without large black spots above ..  | 5. <i>plebeja</i> .     |
| 12 (3). Two transverse nerves standing on the brachial nerve .. .. .   | 6. <i>striatula</i> .   |
| 13 (2). Side margin of frons from base of antenna to base of clypeus longer than the width of the frons between the antennæ.   |                         |
| 14 (17). Head with the eyes as wide as pronotum.   |                         |
| 15 (16). Elytra pale yellow speckled with red .. ..  | 7. <i>cruentata</i> .   |
| 16 (15). Elytra pale brown, costa widely hyaline ..  | 8. <i>Torneella</i> .   |
| 17 (14). Head with the eyes narrower than the pronotum .. .. .   | 9. <i>splendidula</i> . |
| 18 (1). Elytra lanceolate.   |                         |
| 19 (20). Larger; elytra more pointed at apex, the white markings on the crown and pronotum more distinct, clavus without a distinct black spot   | 10. <i>crocea</i> .     |
| 20. 19. Smaller; elytra less pointed at apex, the white markings on the crown and pronotum less distinct, suture with a small black spot just above the apex of the anal nerve .. .. . | 11. <i>attenuata</i> .  |

1. *Thamnotettix prasina*, Fall.

*Cicada prasina*, Fall., Hem. Suec., ii., 40, 25.

*Jassus simplex*, H.-Scff., Deuts. Ins., 125, 7.

*J. prasinus*, Flor, Rhyn. Liv., ii., 325, 20; Marsh., Ent. Mo. Mag., iii., 103, 26; Kirschb., Cicad., 93, 22; Thoms., Opusc. Ent., i., 48, 72.

*Aphrodes sulphureus*, Curt., Brit. Ent., 633, 10.

*Thamnotettix prasina*, Zett., Ins. Lapp., 293, 2.

*T. confinis*, Zett., l. c., 293, 3.

*T. tincta*, Zett., l. c., 293, 6.

*T. stupidula*, Zett., l. c., 294, 9; J. Sahl., Not. Fenn., xii., 216, 8; Edw., Ent. Mo. Mag., xx., 207.

*T. simplex*, J. Sahl., Not. Fenn., xii., 215, 7.

*Athysanus prasinus*, Scott, Ent. Mo. Mag., xii., 99, 12; Ferrari, Cicad. agri Ligust., 55, 3 and 60, 137.

*A. simplex*, Reut., Medd. Faun. Flor. Fenn., v. (1880), 213, 216 and 227, 44; Ferrari, l. c., 55, 4.

*A. tinctus*, Reut., l. c., 212, 215 and 227, 43.

Upper side greenish yellow or greyish green. Crown in the male as long as half its basal width, about one-half longer in the middle than at the sides, free sides feebly arcuate, angle widely rounded; in the female distinctly longer than half its basal width, nearly twice as long in the middle as at the sides, free sides straight, angle blunt; the dark markings are of the same type as in *Athysanus Sahlbergi*, &c., but are rarely developed, although their position is generally indicated by sundry pale brown spots or lines. Frons pale brown, with the apex, a linear middle stripe, and the side-lines yellow. Pronotum about one-third longer than the crown. Elytra more or less strongly tinged with fuscous at the apex; nerves yellow. Abdomen black, connexivum and the apex beneath yellow. Legs yellow, with black points; under side of thighs sometimes with a black line indicating the commencement of a band on the apical third. Length,  $6\frac{1}{2}$ —7 mm.

On various trees in woods; common. A variety of this species, which has the inner areas of the elytra more or less filled up with dark fuscous, is the *Thamnotettix stupidula*, Zett., and another, in which the head, pronotum, and scutellum are tinged with red, is the *T. tincta* of the same author. Judging from Kirschbaum's description (Cicad., 94, 23) his *T. Zelleri* is quite distinct from this species.

2. *Thamnotettix dilutior*, Kbm.

*Thamnotettix dilutior*, Kirschb., Cicad., 92, 20.

*Athysanus dilutior*, Scott, Ent. Mo. Mag., xii., 99, 11.

Crown, pronotum, and scutellum yellowish white, generally with indistinct rust-yellow markings. Crown (with the eyes) almost crescent-shaped, obtusely produced in front, less so in the female than in the male, its length down the middle about one-fourth longer than half its basal width, in the male one-third, in the female about one-half, longer in the middle than at the sides. Frons brownish yellow, with pale side-lines. Pronotum about one-third longer than the crown. Elytra greyish yellow, sometimes with a few isolated blackish spots or suture narrowly blackish, or a black spot in the apex of the clavus; nerves fine, whitish. Abdomen above in the male black, hind margins of the segments narrowly pale, genital valve semicircular; in the female yellow, sometimes with the base of the segments more or less widely black. Legs pale yellow, striped, spotted, and sometimes banded with black. Length, 6—6½ mm.

Not uncommon on oaks.

9. *Thamnotettix subfuscula*, Fall.

*Cicada subfuscula*, Fall., Hem. Suec., ii., 44, 31.

*Thamnotettix subfuscula*, Zett., Ins. Lapp., 294, 8;  
J. Sahl., Not. Fenn., xii., 218, 10.

*Jassus subfusculus*, H.-Scff., Deuts. Ins., 130, 4; Germ.,  
Faun. Ins. Eur., xvi., 19; Flor. Rhyn. Liv., ii.,  
354, 21; Marsh., Ent. Mo. Mag., iii., 85, 25;  
Kirschb., Cicad., 93, 21; Thoms., Opusc. Ent.,  
i., 49, 8.

*J. pectoralis*, Germ., Mag. d'Ent., iv., 91, 30; Burm.,  
Handb., ii., 111. 3.

*Athysanus subfusculus*, Scott, Ent. Mo. Mag., xii., 99,  
10; Reut., Medd. Faun. Flor. Fenn., v. (1880),  
226, 38; Ferrari, Cicad. agri Ligust., 56, 15 and  
58, 180.

Upper side yellow-brown, suture of elytra frequently blackish. Crown in the male as long as half its basal width, about one-third longer in the middle than at the sides; in the female about one-third longer than half its basal width, nearly twice as long in the middle as at the sides; free sides nearly straight and angle blunt in both sexes; interocular line, when present, widened and interrupted in the middle; interocellar line widened, angular, and

interrupted in the middle; infraocellar line feeble, biarcuate. Frons black, a linear middle stripe dilated at the clypeus and the side-lines yellow. Pronotum about one-third longer than crown, with four or six black points in front, and some feeble traces of three or five whitish stripes on the hinder two-thirds. Scutellum generally with a dark triangle on each side of the base, and a pair of black points on the disc. Elytra in the male with the suture narrowly and the part adjoining the angular nerves blackish, apical areas fuscous; nerves, especially those near the suture, whitish; in the female uniform yellow-brown, with the nerves but little paler than the ground colour. Abdomen black; hind margin of the last dorsal segment reddish yellow-brown in the female; genital valve in the male triangular. Legs greyish yellow, striped, spotted, and banded with black. Length, 5—6 mm.

Common throughout the summer on various trees and bushes. I have taken males amongst low herbage in a bog in April in company with *Athysanus grisescens*, Zett. Specimens of the male occur in which the elytra, especially on each side of the nerves, are thickly speckled with fuscous, and the latter appear more decidedly pale in consequence.

#### 4. *Thamnotettix variegata*, Kbm.

*Athysanus variegatus*, Kirschb., Athys. Art., 9, 8.

*Thamnotettix variegata*, Kirschb., Cicad., 112, 57;

J. Sahl., Not. Fenn., xii., 211, 4.

*Athysanus irroratus*, Scott, Ent. Mo. Mag., xii., 96, 5.

*A. variegatus*, Reut., Medd. Faun. Flor. Fenn., v. (1880), 211, 212 and 218, 19; Ferrari, Cicad. agri Ligust., 57, 23 and 59, 133 (forte).

Crown (in the female) about one-fourth longer than half its basal width, one-third longer in the middle than at the sides, free sides very feebly arcuate, angle blunt; interocular line much dilated and interrupted in the middle, its hind margin angularly indented near each eye; interocellar line represented by four black points, of which the middle pair are occasionally wanting; infraocellar line biarcuate, abbreviated at each end, and interrupted in the middle, each half forming the upper margin of one of the two black patches on the frons. Frons yellow with black markings, which are reduced or obsolete between the antennæ and the apex. Pronotum greyish yellow, with a few black points in front, and four longitudinal series of short transverse fuscous lines on the

hinder two-thirds. Scutellum greyish yellow, with a triangle on each side of the base, a pair of points on the disc, a linear stripe on the basal half, and a pair of wide stripes on the apical half, black. Elytra greyish yellow, more or less closely speckled with black, the transverse nerve, the apices of the anal and axillary nerves, and the ramifications of the others, white. Abdomen above black, sides and apex yellow. Legs greyish yellow, banded, striped, and spotted with black. Length, 4 mm.

Widely distributed but not common, and probably overlooked. Exceptionally dark examples do not exhibit the white portions of the nerves so distinctly as specimens of average coloration. A dark male from Deal has the black stripe on the inner side of the hind tibiae thickened above and below, so as to give that part somewhat the appearance one finds in *Pediopsis tibialis*, Scott.

##### 5. *Thamnotettix plebeja*, Fall.

*Cicada plebeja*, Fall., Hem. Suec., ii., 36, 19.

*Thamnotettix plebeja*, Zett., Ins. Lap., 295, 12; J. Sahl., Not. Fenn., xii., 211, 3.

*Jassus plebejus*, H.-Seff., Deuts. Ins., 130, 7; Thoms., Opusc. Ent., i., 47, 4.

*Athysanus plebejus*, Flor, Rhyn. Liv., ii., 291, 10; Kirschb., Athys. Art., 8, 6; Cicad., 11, 54; Scott, Ent. Mo. Mag., xii., 98, 8; Ferrari, Cicad. agri Ligust., 57, 24 and 59, 132 (?).

*A. Schenkii*. Kirschb., Cicad., 111, 56; Reut., Medd. Faun. Flor. Fenn., v. (1880), 211, 213 and 218, 18.

Very nearly resembles the preceding in colour and markings, but is larger and wider, with the white portions of the nerves more decidedly milk-white, and the two uppermost of the black transverse side-lines on the frons, although stronger than the rest, never coalesce with the infraocellar line to form a pair of black patches, as in the last species. Crown in the male a little longer than half its basal width, about one-fourth longer in the middle than at the sides, in the female one-third longer than half its basal width, one-third longer in the middle than at the sides, free sides distinctly arcuate, angle blunt. Length, 5 mm.

This species occurred in profusion amongst long grass in a badly-kept garden at Norwich in July and August, but I have seen no other examples.

6. *Thamnotettix striatula*, Fall.

*Cicada striatula*, Fall., Hem. Suec., ii., 46, 33.

*Thamnotettix striatula*, Zett., Ins. Lap., 294, 10.

*Jassus striatulus*, H.-Seff., Deuts. Ins., 130, 8; Flor, Rhyn. Liv., ii., 361, 24; Marsh., Ent. Mo. Mag., iii., 84, 24; Kirschb., Cicad., 96, 26; Thoms., Opusc. Ent., i., 64, 43.

*J. corniculus*, Marsh, l. c., 119.

*Limotettix striatula*, J. Sahl., Not. Fenn., xii., 253, 23.

*Athysanus striatulus*, Scott, Ent. Mo. Mag., xii., 100, 13; Reut., Medd. Faun. Flor. Fenn., v. (1880), 208, 203 and 215, 12; Ferrari, Cicad. agri Ligust., 56, 16.

Upper side greyish yellow, with strong black markings; all the areas of elytra margined with black. Crown (in the female) about one-fourth longer than half its basal width, one-third longer in the middle than at the sides, free sides nearly straight, angle blunt; basal markings represented by a black transverse line, which touches the interocular line in three equidistant points; interocular line complete; interocellar line represented by a pair of short curved lines running parallel with the biarcuate infraocellar line, the latter interrupted in the middle. Frons black, with the apex, a fine middle stripe, and the side-lines, pale. Pronotum about one-third longer than the crown, greyish yellow mottled with black. Scutellum greyish yellow, with distinct black markings. Elytra greyish yellow, all the areas margined with black, and the first subapical area filled up with the same colour; nerves concolorous, the two transverse ones widened. Breast and abdomen black, the latter with the hind margins of the segments narrowly pale. Legs brownish yellow, striped, spotted, and more or less widely banded with black. Length,  $2\frac{3}{4}$ —4 mm.

Apparently scarce. Said to occur amongst *Trifolium arvense*. Marshall took it rather commonly at Rannoeh in July, 1866, on *Pteris*, in open places where the heather had been burned.

7. *Thamnotettix cruentata*, Panz.

*Cicada cruentata*, Panz., Deuts. Ins., 61, 15; Fall., Hem. Suec., ii., 41, 27.

*Jassus cruentatus*, Flor, Rhyn. Liv., iii., 330, 7; Marsh., Ent. Mo. Mag., iii., 84, 23; Kirschb., Cicad., 96, 27; Thoms., Opusc. Ent., i., 50, 11.

*Thamnotettix cruentata*, Zett., Ins. Lap., 293, 5;  
 J. Sahl., Not. Fenn., xii., 220, 12; Scott, Ent.  
 Mo. Mag., xii., 22, 3; Ferrari, Cicad. agri  
 Ligust., 50, 3; Fieb., Cicad. d'Eur. (*Thamno-*  
*tettix*), 84, 19.

Upper side pale greyish yellow, finely and more or less closely speckled with blood-red. Forehead in the male with a pair of roundish black spots, and these are sometimes indicated in the female. Abdomen above black, narrowly pale at the sides. Legs pale; inner edge of hind tibiæ generally narrowly black. Length, 5—6 mm.

Widely distributed, but local.

#### 8. *Thamnotettix Torneella*, Zett.

*Thamnotettix Torneella*, Zett., Ins. Lap., 294, 7;  
 J. Sahl., Not. Fenn., xii., 221, 13; Fieb., Cicad.  
 d'Eur. (*Thamnotettix*), 76, 14.

*T. punctifrons*, Scott, Ent. Mo. Mag., xii., 24, 7.

*Jassus Torneellus*, Flor, Rhyn. Liv., ii., 350, 18;  
 Thoms., Opusc. Ent., i., 50, 10.

*J. punctifrons*, Marsh., Ent. Mo. Mag., iii., 31, 19.

Crown subnate, a little longer than half its basal width, yellowish white, with a black or brown transverse band. Frons yellowish white; forehead with two round black spots. Pronotum yellowish white, about one-half longer than the crown, narrowly black in front, greyish behind. Elytra pale brown, with fine yellowish white nerves, the costa widely and the membrane hyaline, the latter smoky at the apex. Breast and abdomen black, sides of the the latter and the margins of the segments narrowly yellow. Legs yellowish white; hind tibiæ with a black stripe on the inner side. Length,  $4\frac{1}{2}$ —5 mm.

Marshall found this species common in Epping Forest, frequenting apparently several different kinds of trees, but the only recent specimens that I have seen were taken by the late George Norman, by beating heather on a dry bank at Forres in the spring.

#### 9. *Thamnotettix splendidula*, Fab.

*Cicada splendidula*, Fab., Sys. Rhyn., 79, 83; Fall.,  
 Hem. Suec., ii., 43, 30.

*Jassus splendidulus*, Flor, Rhyn. Liv., ii., 356, 23;  
 Marsh., Ent. Mo. Mag., iii., 82, 20; Kirschb.,  
 Cicad., 98, 31; Thoms., Opusc. Ent., i., 49, 9.

*Thamnotettix splendida*, J. Sahl., Not. Fenn., xii., 219, 11; Scott, Ent. Mo. Mag., xii., 23, 6; Fieb., Cicad. d'Eur. (*Thamnotettix*), 75, 13.

Crown and forehead yellow, each with two subquadrate black spots. Frons yellow with black side-lines. Pronotum greyish yellow, with a few black points in front and sometimes four abbreviated fuscous stripes on the hinder two-thirds. Scutellum yellow, a triangle on each side of the base and a pair of points on the disc black. Elytra pale brownish yellow, the first apical area, a more or less distinct spot at the base and apex of the third and fourth subapical areas, a spot at the apex of the brachial area, and the suture narrowly, blackish brown; the transverse nerve, the apices of the anal and axillary nerves, and the ramifications of the others distinctly whitish. Abdomen above black; hind margin of the last dorsal segment in the female yellow. Legs greyish yellow; inner edge of hind tibiæ narrowly black. Length, 5 mm.

Not uncommon on various trees and bushes. Specimens occasionally occur in which all the areas of the elytra are more or less filled up with blackish brown.

10. *Thamnotettix crocea*, H.-S.

*Jassus croceus*, H.-Seff., Deuts. Ins., 144, 7.

*J. attenuatus*, Marsh., Ent. Mo. Mag., iii., 29, 16.

*Deltocephalus oxypterus*, Kirschb., Cicad., 130, 91.

*Thamnotettix crocea*, Scott, Ent. Mo. Mag., xii., 22, 1;  
Ferrari, Cicad. agri Ligust., 50, 6 and 54, 123;  
Fieb., Cicad. d'Eur. (*Thamnotettix*), 72, 11.

Crown and pronotum rust-yellow, the former with four, the latter with five white stripes; interocellar line represented by an oblique black line on each side of the apex of the crown. Scutellum rust-yellow, with three white stripes. Elytra pale brownish yellow, second apical area filled up with dark fuscous, and sometimes the third subapical, the subcostal area, and the suture are narrowly bordered with fuscous; nerves whitish, that of the suture conspicuously white. Abdomen above black, sides narrowly yellow; genital plates in the male narrowly rounded at the apex; hind margin of the last ventral segment in the female nearly straight. Legs pale greyish yellow, a point at the apex of the hind thighs on the inner side and the inner side of the hind tibiæ narrowly black. Length,  $4\frac{1}{2}$ — $5\frac{1}{2}$  mm.

Very common amongst grasses.

11. *Thamnotettix attenuata*, Germ.

*Jassus attenuatus*, Germ., Mag. d'Ent., iv., 91, 31.

*J. rupicapra*, Marsh., Ent. Mo. Mag., iii., 30, 17.

*Deltocephalus croceus*, Kirschb., Cicad., 131, 92.

*Thamnotettix attenuata*, Scott, Ent. Mo. Mag., xii., 22,  
2; Ferrari, Cicad. agri Ligust., 50, 7; Fieb.,  
Cicad. d'Eur. (*Thamnotettix*), 73, 12.

Very similar in appearance to the preceding species, but smaller, with the white stripes on the crown, pronotum, and scutellum less distinct, the elytra less pointed, bearing on the disc a few irregular blackish spots, and a very constant small blackish spot on the middle of the suture of each. Genital plates subtruncate at the apex; hind margin of the last ventral segment in the female strongly concave. Length, 4 mm.

Amongst fine grasses in dry places; not generally common.

vi. LIMOTETTIX, *J. Sahl.* (Pl. III., fig. 14).

*J. Sahlberg*, Not. Fenn., xii., 224, 25 (1871).

Body elongate or oblong, generally much narrowed behind. Head obtuse in front; crown sublunate or more or less produced; frons nearly straight-sided, its width between the antennæ equal to or somewhat greater than the width of one of the checks. Sides of the pronotum very short, subterete. Elytra ample, longer than the abdomen, overlapping at the apex; appendix well-developed.

## TABLE OF SPECIES.

- |         |  |    |                       |
|---------|--|----|-----------------------|
| 1 (12). | Elytra with four subapical areas.  |    |                       |
| 2 (3).  | Crown with a black band .. .. .  | 1. | <i>striola</i> .      |
| 3 (2).  | Crown not banded with black.   |    |                       |
| 4 (11). | Forehead with black spots.   |    |                       |
| 5 (6).  | ♂ brownish yellow, face and legs strongly tinged with red; ♀ greyish yellow ..                         | 2. | <i>antennata</i> .    |
| 6 (5).  | Species yellow or greenish yellow, sometimes with black stripes on the elytra.                         |    |                       |
| 7 (8).  | Spots on the forehead sublunate .. ..  | 3. | <i>intermedia</i> .   |
| 8 (7).  | Spots on the forehead roundish.  |    |                       |
| 9 (10). | Elytra pellucid, with yellow nerves, rarely with ill-defined fuscous stripes in the clavus .. .. .     | 4. | <i>quadrinotata</i> . |
| 10 (9). | Elytra yellow, with distinct black stripes, which in the male occupy almost the entire surface .. .. . | 5. | <i>nigricornis</i> .  |

- 11 (4). Forehead without black spots .. .. 6. *sulphurella*.  
 12 (1). Elytra with three subapical areas.  
 13 (14). Outer cubital nerve distinct, at least on its  
     basal half .. .. . 7. *metrius*.  
 14 (13). Outer cubital nerve obsolete or wanting.  
 15 (18). Frons without black transverse lines.  
 16 (17). Frons with a black spot just above the  
     clypeus .. .. . 8. *septemnotata*.  
 17 (16). Frons without a black spot at the apex .. 9. *variata*.  
 18 (15). Frons with black transverse lines .. .. 10. *serenotata*.

1. *Limotettix striola*, Fall.

*Cicada striola*, Fall., Act. Holm., 1806, 31, 28; Hem.  
 Suec., ii., 44, 32.

*Jassus striola*, H.-Seff., Deuts. Ins., 124, 4, *e* and *f*;  
 Flor, Rhyn. Liv., ii., 315, 1; Marsh., Ent. Mo.  
 Mag., iii., 126, 30; Kirschb., Cicad., 87, 11;  
 Thoms., Opusc. Ent., i., 63, 40.

*J. frenatus*, Germ., Mag. d'Ent., iv., 86, 16.

*Limotettix striola*, J. Sahl., Not. Fenn., xii., 226, 1.

*Athysanus striola*, Scott, Ent. Mo. Mag., xii., 168, 14;  
 Ferrari, Cicad. agri Ligust., 55, 9 and 58, 127.

Upper side dirty greyish or greenish yellow. Crown sublunate, a little produced in front in the female; interocular line broad, complete; infraocellar line biarcuate, sometimes confluent with the interocular line in the male. Frons in the male black, with the apex narrowly, a fine middle stripe, and the side-lines, yellow; in the female yellow, with a fine double middle stripe and the side-lines black. Pronotum about one-fourth ( $\sigma$ ) or one-third ( $\rho$ ) longer than the crown, sometimes sparingly speckled with black. Elytra greyish yellow, pellucid; nerves whitish or yellow, sometimes margined with fuscous; claval suture frequently narrowly black. Breast and abdomen black, the sides and margins of the segments narrowly yellow; hind margin of last ventral segment in the female strongly concave. Legs yellow, spotted, striped, and banded with black. Length,  $3\frac{1}{2}$ — $4\frac{1}{2}$  mm.

Locally common in damp places.

2. *Limotettix antennata*, Boh.

*Thamnotettix antennata*, Boh., Sv. Ak. Handl., 1845,  
 35, 11.

*T. frontalis*, Scott, Ent. Mo. Mag., xii., 25, 12; Fieb.,  
 Cicad. d'Eur. (*Thamnotettix*), 86, 21.

*Jassus antennatus*, Marsh., Ent. Mo. Mag., iii., 30, 18 ;

Thoms., Opusc. Ent., i., 59, 29.

*J. longicornis*, Kirschb., Cicad., 95, 30.

*Limotettix antennata*, J. Sahl., Not. Fenn., xii., 238, 10.

♂. Brownish yellow ; face and legs strongly tinged with red :  
 ♀ greyish yellowish ; generally a spot on each temple, and a pair  
 of larger roundish or oblong ones on the forehead and the frontal  
 sutures, black ; occasionally there is a punctiform black spot  
 behind each ocellus. Antennæ nearly as long as the body. Crown  
 about one-third longer than half its basal width, one-third or (in  
 the female) more than one-third longer in the middle than at the  
 sides, free sides gently arcuate, angle pointed. Pronotum subequal  
 in length to the crown. Elytra subhyaline, nerves pale. Breast  
 black, sides widely pale ; abdomen above black, sides narrowly  
 pale, beneath black, connexivum yellow ; last ventral segment in  
 the female roundly produced behind, at least one-half longer than  
 the preceding segment. Hind tibiæ with some points on the outer  
 side and a narrow stripe on the inner side black. Length,  
 5½—6 mm.

Common in marshes. A dark form of the male  
 occurs rarely in which the areas of the elytra, especially  
 those near the suture, are more or less filled up with  
 fuscous. *Jassus antennatus*, Flor (*L. Flori*, J. Sahl), is  
 greenish yellow, with the last ventral segment of the  
 female subequal in length to the preceding segment.

### 3. *Limotettix intermedia*, Boh.

*Thamnotettix intermedia*, Boh., Sv. Ak. Handl., 1845,

40, 15 ; Scott. Ent. Mo. Mag., xii., 25, 10 ; Fieb.,

Cicad. d'Eur. (*Thamnotettix*), 88, 23.

*Jassus intermedius*, Thoms., Opusc. Ent., i., 60, 31.

*Limotettix intermedia*, J. Sahl., Not. Fenn., xii., 235, 8.

*L. lunulifrons*, J. Sahl., *l. c.*, 236, 9.

Yellow or greenish yellow, a point behind each ocellus, and  
 sometimes a pair (which are frequently confluent) between them,  
 a transverse spot on each temple, a pair of sublunate spots on the  
 forehead, a spot at the base of each antenna, a few transverse side-  
 lines on the frons, and the facial sutures, black. Crown in the  
 male subequal in length to half its basal width, about one-half  
 longer in the middle than at the sides, free sides nearly straight,  
 angle blunt. Pronotum scarcely one-fourth longer than the  
 crown. Elytra flavo-hyaline, nerves yellow. Breast black, sides

of the pro- and mesosternum yellow. Abdomen black, its sides and the margins of the segments narrowly yellow. Legs yellow, with black stripes and points. Length, 5 mm.

Loch Greenin, September, 1866 (*Douglas*).

4. *Limotettix quadrinotata*, Fab.

*Cicada 4-notata*, Fab., Sys. Rhyn., 78, 77; Fall., Hem. Suec., ii., 46, 35.

*Jassus 4-notatus*, H.-Seff., Deuts. Ins., 122, 4c; Flor., Rhyn. Liv., ii., 336, 11; Marsh., Ent. Mo. Mag., iii., 104, 28; Kirschb., Cicad., 102, 38; Thoms., Opusc. Ent., i., 61, 35.

*J. strigipes*, Thoms., l. c., 62, 36.

*Cicadula 4-notata*, Zett., Ins. Lap., 296, 1.

*C. strigipes*, Zett., l. c., 296, 2.

*Aphrodes spilotcephala*, Hardy, Trans. Tynes. F. C., i., 424, 1.

*Limotettix 4-notata*, J. Sahl., Not. Fenn., xii., 229, 4.

*Thamnotettix 4-notata*, Scott, Ent. Mo. Mag., vii., 25, 14; Fieb., Cicad. d'Eur. (*Thamnotettix*), 90, 26.

*T. strigipes*, Fieb., l. c., 64, 5.

Yellow or greenish yellow, a large roundish spot behind each ocellus, two others on the forehead, a spot at the base of the antennæ, the facial sutures, and occasionally some traces of side-lines on the frons, black. Crown subequal in length to half its basal width, about one-half longer in the middle than at the sides, free sides arcuate, angle rounded. Pronotum about one-fourth longer than the crown. Scutellum sometimes with black markings. Elytra pellucid, frequently fumose on the apical third; nerves yellow, sometimes becoming fuscous at the apex. Breast black, sides of pro- and mesosternum narrowly yellow. Abdomen black, its sides and the margins of the segments very narrowly yellow. Legs striped and spotted with black. Length, 4—4½ mm.

Very common amongst grasses. A form with the dark markings exaggerated and some fuscous stripes in the clavus occurs somewhat rarely, and is the *Cicadula strigipes*, Zett., Fieb.

5. *Limotettix nigricornis*, J. Sahl.

*Limotettix nigricornis*, J. Sahl., Not. Fenn., xii., 232, 6.

*Thamnotettix nigricornis*, Scott, Ent. Mo. Mag., xii., 91.

Closely allied to the last species, but about one-half larger, and

also distinguished by the black stripes on the elytra; the latter in the male occupy almost the entire surface, but in the female they are confined to the clavus or entirely wanting; apical areas blackish. Length, 5—5½ mm.

Not common. Colton, Somersetshire (*Power*); it has also been taken by *Blatch*.

#### 6. *Limotettix sulphurella*, Zett.

*Cicadula sulphurella*, Zett., *Ins. Lap.*, 297, 8.

*Cicada virescens*, Fall., *Hem. Suec.*, ii., 52, 45.

*Jassus virescens*, Flor, *Rhyn. Liv.*, ii., 339, 9; *Marsh.*,  
*Ent. Mo. Mag.*, iii., 103, 27; *Kirschb.*, *Cicad.*,  
101, 37; *Thoms.*, *Opusc. Ent.*, i., 61, 34.

*Limotettix sulphurella*, J. Sahl., *Not. Fenn.*, xii., 239, 12.

*Thamnotettix virescens*, Scott, *Ent. Mo. Mag.*, xii., 25,  
13; *Fieb.*, *Cicad. d'Eur. (Thamnotettix)*, 95, 30.

*T. sulphurella*, Ferrari, *Cicad. agri Ligust.*, 51, 13.

Sulphur-yellow, at the base of each antenna a black spot. Crown subequal in length to half its basal width, about one-third longer in the middle than at the sides, free sides gently arcuate, angle blunt. Frons sometimes with traces of fuscous side-lines. Pronotum nearly twice as long as the crown. Elytra flavo-hyaline, nerves yellow. Middle of the breast black. Abdomen above in the male black, sides narrowly yellow; in the female yellow, broadly black down the middle; under side black at the base in both sexes. Outer side of hind tibiae with some black points. Length, 4—5 mm.

Common amongst grasses.

#### 7. *Limotettix metrius*, Flor.

*Jassus metrius*, Flor, *Rhyn. Liv.*, ii., 264, 16; *Kirschb.*,  
*Cicad.*, 137, 107.

*Deltocephalus metrius*, Fieb., *Syn. Eur. Delto.*, 20, 58,  
fig. 58; J. Sahl., *Not. Fenn.*, xii., 326, 19;  
Scott, *Ent. Mo. Mag.*, xii., 241, 3.

♂. Fore parts deep yellow; elytra pale greyish yellow. ♀ dirty yellowish white; the areas towards the apex of the elytra sometimes faintly margined with fuscous; suture occasionally blackish. Crown nearly twice as long as half its basal width, one-half longer in the middle than at the sides, free sides distinctly arcuate, angle blunt. Pronotum subequal in length to the crown. Nerves of the elytra yellow in the male, whitish in the female. Abdomen above

more or less widely black, beneath marked with black on the sides and in the middle of the base; hind margin of the last ventral segment in the female with a small rounded lobe in the middle, bounded on each side by a notch; opposite to each notch a comma-shaped black spot. Legs pale; hind tibiæ with conspicuous black points on the outer side. Length,  $3\frac{1}{2}$ —4 mm.

Amongst long herbage in marshes; not uncommon in East Norfolk. This species may be readily distinguished by the neuration of the elytra; in the structure of the male genitalia it is a true *Limotettix*, although the crown is somewhat Deltoccephaloid.

#### 8. *Limotettix septemnotata*, Fall.

*Cicada 7-notata*, Fall., Act. Holm., 1806, 35, 35;  
Hem. Suec., ii., 49, 38.

*Cicadula 7-notata*, Zett., Ins. Lap., 297, 6; Scott,  
Ent. Mo. Mag., xi., 231, 4; Fieb., Cicad. d'Eur.  
(*Cicadula*), 52, 10.

*Jassus 7-notatus*, Flor, Rhyn. Liv., ii., 339, 12;  
Marsh., Ent. Mo. Mag., iii., 126, 31; Kirschb.,  
Cicad., 100, 24; Thoms., Opusc. Ent. i., 76, 69.

*Limotettix 7-notata*, J. Sahl., Not. Fenn., xii., 251, 21.

Head, pronotum, and scutellum yellow, a large spot in each basal angle of the latter, a pair of points on the base of the crown, two large roundish spots on the forehead, a spot at the base of each antenna, and another just above the clypeus, black. Crown subequal in length to its basal width, about one-half longer in the middle than at the sides, free sides gently arcuate, angle obtusely rounded. Clavus and corium whitish hyaline, each with a broad yellow stripe, reach about two-thirds of its length; inner margin of elytra very narrowly blackish; membrane smoky. Abdomen yellow, with a wide black stripe down the back; saw-case black. Legs yellow; hind tibiæ with a few black points. Length,  $3\frac{1}{2}$  mm.

Not uncommon in marshes. The subantennal spots and the points at the base of the crown are frequently wanting, and a variety of the female occurs in which the pronotum is strongly marked with black, and the claval suture, the brachial nerve, and a narrow stripe just below the costa are blackish.

9. *Limotettix variata*, Fall.

*Cicada variata*, Fall., Act. Holm., 1806, 34, 34; Hem. Suec., ii., 48, 37.

*Jassus fumatus*, H.-Scff., Deuts. Ins., 153, 5.

*J. variatus*, Marsh., Ent. Mo. Mag., iii., 127, 32; Kirschb., Cicad., 99, 32; Thoms., Opusc. Ent., i., 76, 70.

*J. sexnotatus*, var., Flor. Rhyn. Liv., ii., 341.

*Limotettix variata*, J. Sahl., Not. Fenn., xii., 250, 20.

*Cicadula variata*, Scott, Ent. Mo. Mag., xi., 231, 3; Fieb., Cicad. d'Eur. (*Cicadula*), 51, 9.

Head, pronotum, and scutellum yellow, a roundish spot in each basal angle of the latter, a pair of roundish spots on the base of the crown, another pair on the forehead, and the frontal sutures narrowly, black. Crown about one-fourth shorter than its basal width, one-half longer in the middle than at the sides, free sides feebly arcuate, angle blunt. Pronotum about one-fourth longer than the crown. Elytra whitish hyaline, tinged with yellow, within with a broad irregular curved fuscous stripe, which commences at the base and ends at the apex of the clavus, and is produced in the middle of its outer edge about half-way across the corium; second and third subapical areas with a fuscous streak in each. Abdomen above black, sides yellow, beneath yellow, black at the base. Legs yellow; hind tibiae with a few black points. Length, 4 mm.

Scarce; said to occur on oaks.

10. *Limotettix sexnotata*, Fall.

*Cicada 6-notata*, Fall., Act. Holm., 1806, 34, 33; Hem. Suec., ii., 47, 36.

*Cicadula 6-notata*, Zett., Ins. Lap., 297, 4; Scott, Ent. Mo. Mag., xi., 230, 1; Ferrari, Cicad. agri Ligust., 46, 3; Fieb., Cicad. d'Eur. (*Cicadula*), 47, 6.

*C. alpina*, Zett., l. c., 297, 5.

*C. frontalis*, Scott, l. c., 231 (sec. spec. typ.).

*Tettigonia 6-notata*, Germ., Faun. Ins. Eur., xiv., t. 13.

*Eupteryx 6-notatus*, Curt., Brit. Ent., 640, 10.

*Jassus 6-notatus*, H.-Scff., Deuts. Ins., 122, 4 and 164, 6; Flor. Rhyn. Liv., ii., 341, 13; Marsh., Ent. Mo. Mag., iii., 125, 29; Kirschb., Cicad., 95, 25; Thoms., Opusc. Ent., i., 77, 71.

*Limotettix 6-notata*, J. Sahl., Not. Fenn., xii., 247, 19.

Head yellow, basal markings roundish; interocular line widely interrupted in the middle; on the forehead a pair of large roundish subquadrate or oblong black spots; frons with black side-lines. Pronotum yellow, sometimes suffused with blackish. Scutellum yellow, sometimes with a subtriangular black spot on each side of the base. Elytra yellowish grey, subpellucid without markings, or subcoriaceous with a greater or lesser number of the areas each occupied by a fuscous streak; membrane sometimes smoky. Abdomen black, yellow at the apex beneath. Legs yellow, with black lines and points. Length,  $2\frac{3}{4}$ —5 mm.

Excessively abundant amongst grasses. Very variable in size and markings, and also in the dimensions of the crown; the markings on the latter are subject to almost any amount of exaggeration, reduction, or suppression. J. Sahlberg nearly exhausts the alphabet in furnishing distinctive letters for the varieties which he characterises.

vii. GNATHODUS, *Fieb.* (Pl. III., fig. 18).

*Fieb.*, *Neue Gatt. und Art. Hom.*, 9, 21 (1866).

Body oblong, obtuse in front, much narrowed behind. Crown very short, about one-fourth as long as the pronotum, scarcely longer in the middle than at the sides. Elytra much longer than the abdomen, overlapping at the apex; outer branch of the cubital nerve obsolete; membrane very large, as long as the inner margin of the clavus; appendix large. Submarginal wing-nerve complete; upper branch of the second wing-nerve confluent with the first, and running into the submarginal nerve as one nerve; third wing-nerve joined to the lower branch of the second by a transverse nerve.

1. *Gnathodus punctatus*, Thunb.

*Cicada punctata*, Thunb., *Act. Ups.*, vi., 21, 36; *Fall.*, *Hem. Suec.*, ii., 55, 52.

*Eupteryx clypeata*, Curt., *Brit. Ent.*, 640, 12.

*Cicadula punctata*, Zett., *Ins. Lap.*, 298, 10.

*C. spreta*, Zett., *l. c.*, 298, 11.

*Jassus punctatus*, H.-Seff., *Deuts. Ins.*, 122, 6; *Flor.*, *Rhyn. Liv.*, ii., 320, 3; *Marsh.*, *Ent. Mo. Mag.*, iii., 127, 33; *Kirschb.*, *Cicad.*, 90, 16; *Thoms.*, *Opusc. Ent.*, i., 77, 72.

*Gnathodus punctatus*, J. Sahl., *Not. Fenn.*, xii., 204, 1; *Ferrari*, *Cicad. agri Ligust.*, 44, 1 and 45, 107.

♂. Greyish yellow or pale salmon-coloured; elytra with a few black spots arranged in two oblique bands, one on the basal third, the other next the angular nerves; ♀, pale green, the spots on the elytra reduced to two on the clavus, one at the apex, the other near the base, and one or two on the corium next the angular nerves. Crown obtusely produced in front. Head, pronotum, and scutellum sometimes marked with fuscous or black; in the apex of each wing a fuscous streak. Abdomen black, hind margins of the segments narrowly pale. Legs pale; tibiæ sometimes dark towards the apex, and with dark points on the outer side. Length,  $3\frac{1}{2}$ —4 mm.

By sweeping in summer, and beating firs in winter and spring; not very common.

#### XV. TYPHLOCYBIDÆ.

Small, elongate species, for the most part brightly coloured. Ocelli not or scarcely perceptible, sometimes indicated on the forehead. Face very long, triangular. Elytra much longer than the abdomen, overlapping at the apex; appendix wanting (except in *Alebra*). Corium with three simple longitudinal nerves only. The latter character distinguishes this group from all others. The genera are readily separable by the characters derived from the neuration of the elytra and wings.

#### TABLE OF GENERA.

1	(2). Membrane with an appendix	..	..	i. ALEBRA.
2	(1). Membrane without an appendix.			
3	(8). Submarginal wing-nerve continued round the apex of the wing.			
4	(5). Third wing-nerve forked	..	..	.. ii. DICRANEURA.
5	(4). Third wing-nerve simple.			
6	(7). Second apical area triangular	..	..	iii. KYBOS.
7	(6). Second apical area oblong	..	..	.. iv. CHLORITA.
8	(3). Submarginal wing-nerve running out to the margin before the apex of the wing.			
9	(10). First two wing-nerves subparallel throughout			v. EUPTERYX.
10	(9). First two wing-nerves confluent near the apex.			
11	(12). First apical area ample, third irregular in figure	..	..	.. vi. TYPHLOCYBA.
12	(11). First apical area very small, third oblong			vii. ZYGINA.

i. ALERRA, *Fieb.* (Pl. III., fig. 16).

*Fieb.*, *Cicad. d'Eur.*, pt. i., 125 (1876).

Body linear. Front and hind margins of the crown parallel, feebly curved. Ocelli distinct. Pronotum distinctly wider than the head with the eyes. Elytra much longer than the abdomen, overlapping at the apex, with a distinct appendage, the three inner apical areas oblong, truncate at the base. Submarginal wing-nerve running into the first nerve; in the apex of the wing three oblong areas. Genital valve wanting in the male.

1. *Alebra albostriella*, Fall.

*Cicada albostriella*, Fall., *Hem. Suec.*, ii., 54, 49.

*C. elegantula*, Zett., *Faun. Ins. Lap.*, 536, 35.

*Typhlocyba albostriella*, H.-Scff., *Deuts. Ins.*, 164, 11;  
Flor., *Rhyn. Liv.*, ii., 382, 1; Kirschb., *Cicad.*,  
177, 1.

*T. elegantula*, id., *l. c.*, 124, 23.

*T. discicollis*, id., *l. c.*, 124, 8.

*T. fulvcola*, id., *l. c.*, 165, 16.

*T. Wahlbergi*, Boh., *Sv. Ak. Handl.*, 42, 17 (1847).

*T. eximia*, Hardy, *Trans. Tynes. F. C.*, i., 417, 2.

*Cicadula elegantula*, Zett., *Ins. Lap.*, 298, 12.

*Eupteryx fasciata*, Curt., *Brit. Ent.*, 640, 3.

*E. albostriellus*, Marsh., *Ent. Mo. Mag.*, iii., 218, 1.

*Compsus albostriella*, J. Sahl., *Not. Fenn.*, xii., 156, 1.

*Alebra albostriella*, Leth., *Cat. Hem. Nord.*, ed. ii., 64  
and 77; Ferrari, *Cicad. agri Ligust.*, 74 and 75;  
*Fieb.*, *Cicad. d'Eur. (Typhlocybini)*, 1.

This handsome insect presents the following well-marked colour varieties:—

♂. Fore parts and legs yellow or red-yellow; elytra yellow or greenish yellow; apices of the areas of the corium and the membrane fumose.

♀. *a.* Upper side, face and legs white, the two latter sometimes tinged with yellow; two broad stripes on the pronotum, the suture of the elytra broadly, a stripe in the brachial area, and a broad one along the costa, yellow; apices of the areas of the corium and the membrane faintly fumose. The stripes on the pronotum and the suture of the elytra are frequently red.

*b.* Upper side, face and legs white, the two latter sometimes tinged with yellow; hind part of the crown, the pronotum (except

at the sides), and the scutellum, dark brown; elytra with a stripe along the suture, one in the brachial area, and another along the costa, yellow; on the inner margin just behind the middle a large ill-defined dark brown spot.—Length,  $2\frac{3}{4}$ – $3\frac{1}{2}$  mm.

By beating various trees and bushes; common.

ii. DICRANEURA, *Hardy*. (Pl. III., fig. 19).

Hardy, Trans. Tynes. F. C., i., 423, 1850 (*Dikraneura*).

Body small, linear. Head obtusely produced in front. Elytra much longer than the abdomen; nerves of the membrane subparallel; appendix wanting. Submarginal wing-nerve complete; first and second wing-nerves confluent before the apex, and running into the submarginal nerve as one nerve; third wing-nerve forked and joined to the second by a transverse nerve.

This genus is equivalent to *Notus* and *Erythria*, Fieb. All the species live amongst grasses and other low plants.

TABLE OF SPECIES.

- |    |   |                         |
|----|---|-------------------------|
| 1  | (8). Wing-nerves pale.  |                         |
| 2  | (3). Front of crown angular (more conspicuously in the ♀) .. . . .  | 1. <i>flavipennis</i> . |
| 3  | (2). Front of crown not angular.  |                         |
| 4  | (7). Genital plates subcylindrical, curved, approaching at the base and apex.   |                         |
| 5  | (6). Genital plates wide and stout, their apices (viewed from the side) truncate, bounded on each side by an erect blackish tooth ..  | 2. <i>citrinella</i> .  |
| 6  | (5). Genital plates long, slender, their apices pointed; on the inner margin just below the apex a strong triangular tooth .. ..  | 3. <i>similis</i> .     |
| 7  | (4). Genital plates elongate-triangular, flat, their inner margins subcontiguous. Penis black, resembling the claw-joint of a <i>Carabus</i> . Lobes of pygofer in the male each with a large blackish horn on the inner side near the apex .. .. . | 4. <i>mollicula</i> .   |
| 8  | (1). Principal wing-nerves fuscous or black.  |                         |
| 9  | (10). Scutellum with a distinct black spot at the apex .. .. .  | 5. <i>pygmaea</i> .     |
| 10 | (9). Scutellum immaculate.  |                         |
| 11 | (12). Elytra membranous, more than three times as long as wide; suprabrachial area and the apical half of the subcostal area hyaline ..   | 6. <i>variata</i> .     |
| 12 | (11). Elytra subcoriaceous, about $2\frac{1}{2}$ times as long as wide, opaque throughout .. ..   | 7. <i>aureola</i> .     |

1. *Dicraneura flavipennis*, Zett.

*Cicada flavipennis*, Zett., Ins. Lap., 292, 15.

*Typhlocyba flavipennis*, Flor, Rhyn. Liv., ii., 388, 4 ;  
Kirschb., Cicad., 180, 8.

*Eupteryx flavipennis*, Marsh., Ent. Mo. Mag., iii., 219, 3.

*Notus flavipennis*, J. Sahl., Not. Fenn., xii., 163, 1 ;

Leth., Cat. Hem. Nord., ed. ii., 64, 68 and 78 ;

Ferrari, Cicad. agri Ligust., 76 and 77 ; Fieb.,

Cicad. d'Eur. (*Typhlocybini*), 12, 5.

Deep yellow ; abdomen above black. Hind margin of pronotum with an arcuate notch of equal width with the base of the scutellum. Elytra deep yellow ; membrane whitish hyaline. Hind tibiæ with a row of distinct black points. Length,  $3\frac{3}{4}$  mm.

Common amongst *Carices*. This species is readily distinguished by its Deltocephaloid crown and the uniform distribution of the yellow pigment in the elytra.

2. *Dicraneura citrinella*, Zett.

*Cicada citrinella*, Zett., Faun. Ins. Lap., 536, 36.

*Cicadula citrinella*, Zett., Ins. Lap., 299, 13.

*Typhlocyba citrinella*, H.-Scff., Deuts. Ins., 124, 2.

*T. forcipata*, Flor, Rhyn. Liv., ii., 389, 5 ; Kirschb.,  
Cicad., 181, 9.

*T. gracilis*, Zett., Ins. Lap., 299, 14.

*Notus citrinellus*, J. Sahl., Not. Fenn., xii., 165, 3 ;

Ferrari, Cicad. agri Ligust., 76 and 77.

*N. Schmidtii*, Leth., Cat. Hem. Nord., ed. ii., 65, 69  
and 80 ; Ferrari, *l. c.* ; Fieb., Cicad. d'Eur.

(*Typhlocybini*), 15, 8.

Dirty yellow ; abdomen above black, paler towards the apex. Corium dirty yellow, the apical half of the subcostal area, the suprabrachial area, and the apical third of the brachial area, hyaline. Membrane fusco-hyaline. Hind tibiæ with a row of distinct black points. Length,  $3\frac{1}{2}$  mm.

Foxley Wood, Norfolk.

3. *Dicraneura similis*, Edw.

*Dicraneoneura similis*, Edw., Ent. Mo. Mag., xxi., 229.

Very similar in size and colour to the last, from which it is best distinguished by the structure of the male genitalia. I cannot lay

down any characters by which to separate the females of the two species. Length,  $3\frac{1}{2}$  mm.

By sweeping grasses on wet commons in Norfolk; not unfrequent. In the original description (*l. c.*) I credit this species with *flat* genital plates: this mistake I attribute to insufficient examination of the only specimen then at hand before mounting for the microscope: the genital plates in this species agree with those of *D. citrinella* in their pincer-like formation (Pl. III., fig. 17).

#### 4. *Dicraneura mollicula*, Boh.

*Typhlocyba mollicula*, Boh., Sv. Ak. Handl., 43, 18 (1847).

*T. facialis*, Flor, Rhyn. Liv., ii., 385, 2.

*T. Flori*, Kirschb., Cicad., 179, 6.

*Notus molliculus*, J. Sahl., Not. Fenn., xii., 166, 4; Ferrari, Cicad. agri Ligust., 76 and 77; Fieb., Cicad. d'Eur. (*Typhlocybini*), 13, 6.

*N. facialis*, Leth., Cat. Hem. Nord., ed. ii., 65, 69 and 79.

*Dicranoneura mollicula*, Dougl., Ent. Mo. Mag., xii., 28, 3.

*D. citrinella*, id., *l. c.*

Yellow, in some examples inclining to orange; abdomen above generally black towards the base. Hind margin of pronotum at most faintly concave. Elytra yellow, the membrane and a spot in the apex of the subcostal and suprabrachial areas hyaline. Length,  $3\frac{1}{2}$  mm.

Very common amongst low plants in a variety of situations.

#### 5. *Dicraneura pygmæa*, Dougl.

*Dicranoneura pygmæa*, Dougl., Ent. Mo. Mag., xii., 203.

♂. Orange-yellow; abdomen above black, genitalia yellow. Corium and clavus inwardly paler orange than on their outer sides, nerves deeper orange, inner margin of the clavus with a fuscous line. Membrane with a slightly fuscous tinge; nerves pale orange. Legs pale orange; claws infuscated. Length,  $2\frac{1}{3}$  mm.

Darenth Wood, October (*Douglas*). The single male on which this species was founded still remains unique.

6. *Dicraneura variata*, Hardy.

*Dicraneura variata*, Hardy, Trans. Tynes. F. C., i., 423, 1.

*Typhlocyba citrinella*, Flor, Rhyn. Liv., ii., 386, 3; Kirschb., Cicad., 180, 7.

*Eupteryx citrinellus*, Marsh., Ent. Mo. Mag., iii., 218, 2.

*Notus aridellus*, J. Sahl., Not. Fenn., xii., 167, 5.

*N. cephalotes*, Leth., Cat. Hem. Nord., ed. ii., 64, 68 and 78; Fieb., Cicad. d'Eur. (*Typhlocybini*), 9, 2.

Pale greenish yellow, dull; abdomen black. The colour of the elytra varies to dark green, sometimes with a reddish tinge, or occasionally deep orange-red, the latter in northern examples. Length,  $3\frac{1}{4}$  mm.

Locally common amongst low plants in damp places.

7. *Dicraneura aureola*, Fall.

*Cicada aureola*, Fall., Hem. Suec., ii., 39, 22.

*Jassus aureolus*, Germ., Faun. Ins. Eur., xvii., 20.

*Typhlocyba aureola*, H.-Scff., Deuts. Ins., 164, 16; Flor, Rhyn. Liv., ii., 391, 6; Kirschb., Cicad., 182, 11.

*T. chlorophana*, H.-Scff., l. c., 124, 9.

*Erythria aureola*, J. Sahl., Not. Fenn., xii., 202, 1; Fieb., Cicad. d'Eur. (*Typhlocybini*), 6, 3.

*Notus aureolus*, Leth., Cat. Hem. Nord., ed. ii., 64, 68 and 78; Ferrari, Cicad. agri Ligust., 75.

Short and stout. Crown, pronotum, and scutellum yellow; elytra light yellowish green; abdomen above black. Fore parts and legs, particularly the face and the latter, frequently tinged with red. Length,  $2\frac{3}{8}$ — $2\frac{1}{4}$  mm.

On *Carices*, Findhorn Marsh, Forres, Morayshire (Norman). It is said to occur on *Calluna* in August and September.

## iii. KYBOS, Fieb. (Pl. III., fig. 20.

Fieb., Cicad. d'Eur., pt. i., 127 (1876).

Body moderately stout. Crown one-half or less than half as long as the pronotum, its front and hind margins feebly curved, subparallel. Ocelli distinct. Elytra longer than the abdomen; second apical area triangular; appendix wanting. Submarginal wing-nerve running into the confluent continuation of the first and

second nerves; third wing-nerve simple, joined to the second by a transverse nerve. Genital valve well-developed in the male.

1. *Kybos smaragdula*, Fall.

*Cicada smaragdula*, Fall., Hem. Suec., ii., 53, 46.

*Cicadula smaragdula*, Zett., Ins. Lap., 298, 9; J. Sahl., Not. Fenn., xii., 159, 1.

*Typhlocyba smaragdula*, H.-Seff., Deuts. Ins., 124, 8, and 164, 16; Flor, Rhyn. Liv., ii., 393, 8; Kirschb., Cicad., 178, 2.

*Eupteryx viridipes*, Curt., Brit. Ent., 640, 9.

*E. smaragdulus*, Marsh., Ent. Mo. Mag., iii., 219, 5.

*Kybos smaragdulus*, Leth., Cat. Hem. Nord., ed. ii., 65 and 81; Fieb., Cicad. d'Eur. (*Typhlocybini*), 27, 1.

Green or greenish yellow, shining; crown, pronotum, and scutellum with a narrow pale stripe; the latter is frequently bounded on each side by a dark stripe, or the upper fore parts are entirely reddish or dark brown. Inner margin of elytra generally bearing a fuscous stripe, which sometimes extends to the membrane; claval suture frequently narrowly fuscous. Abdomen above black; hind margins of the segments more or less widely pale. Legs green, claws black. Length, 4–8½ mm.

Common on poplars, willows, and sallows.

iv. CHLORITA, *Fieb.* (Pl. III., fig. 22).

Fieber, Cicad. d'Eur., pt. i., 126 (1876).

Elongate, delicate species, pale green in colour. Crown (with the eyes) crescent-shaped, more or less pointed. Elytra longer than the abdomen; second apical area oblong; appendix wanting. Neuration of the wings as in the last genus. Genital valve wanting in the male.

Our two species may be thus distinguished:—

- |  |    |                        |
|--|----|------------------------|
| Suprabrachial area hyaline throughout..        | .. | 1. <i>flavescens</i> . |
| Suprabrachial area hyaline at the apex only .. | .. | 2. <i>viridula</i> .   |

1. *Chlorita flavescens*, Fab.

*Cicada flavescens*, Fab., Ent. Syst., iv., 46, 85; Sys. Rhyn., 79, 85.

*Typhlocyba flavescens*, Flor, Rhyn. Liv., ii., 394, 9; Kirschb., Cicad., 178, 3.

- Eupteryx flavescens*, Marsh., Ent. Mo. Mag., iii, 220, 6.  
*Cicadula flavescens*, J. Sahl., Not. Fenn., xii., 161, 3.  
*Chlorita flavescens*, Fieb., Cicad. d'Eur. (*Typhlocybini*),  
 18 and 25.

Yellowish green; a spot in the apex of the subcostal area, the entire suprabrachial area, a large subtriangular spot in the apex of the brachial area, and the membrane, hyaline; the latter very faintly tinged with fuscous. The white silky hairs on the apex of the male genital plates twice as long as the erect bristles which clothe the other portions of the same. Length,  $3\frac{1}{2}$ —4 mm.

Common on various trees and bushes throughout the autumn, and on firs in winter and spring. Judging from a type received from Norman, this species is the *C. apicalis* of his Morayshire list (Ent. Mo. Mag., xv., 256).

## 2. *Chlorita viridula*, Fall.

- Cicada viridula*, Fall., Hem. Suec., ii., 53, 47.  
*Typhlocyba viridula*, H.-Scff., Deuts. Ins., 161, 14 and  
 16; Flor, Rhyn. Liv., ii., 392, 7; Kirschb.,  
 Cicad., 178, 4.  
*Eupteryx Solani*, Curt., Morton's Cyclop. Agric., i.,  
 772.  
*E. viridulus*, Marsh., Ent. Mo. Mag., iii., 219, 4.  
*Cicadula viridula*, J. Sahl., Not. Fenn., xii., 160, 2.  
*Chlorita viridula*, Fieb., Cicad. d'Eur. (*Typhlocybini*),  
 22 and 25.

Green, with pale or white markings on the head, pronotum, and scutellum; these markings are very variable, and are best seen in the fresh insect; the most constant of them seems to be a white stripe on the basal two-thirds of the scutellum. A spot in the apex of the subcostal and suprabrachial areas, a large subtriangular spot in the apex of the brachial area, and the membrane, hyaline; the latter very faintly tinged with fuscous. The white silky hairs on the apex of the male genital plates subequal in length to the erect bristles on the remainder of the same. Length, 3 mm.

Equally common with the last, and frequently taken in company with it. *C. apicalis*, Flor, has been recorded as British, but it seems to me in error; Marshall's exponents of it consisted of several different species of *Typhlocyba*, and a reputed example in Douglas' collection is certainly *C. viridula*. Lethierry, Fieber, and Ferrari

recognise a species, *C. solani*, Koll., which ought to occur here. It has the head narrower than the pronotum, and Ferrari says that it has the suprabrachial area hyaline, while Lethierry and Fieber credit it with unicoloured elytra. It is remarkable that Lethierry does not include *C. viridula* in his Cat. Hem. Dept. du Nord.

v. EUPTERYX, *Curt.* (Pl. III., 25).

Curtis, *Ent. Mag.*, i. (1832).

Body elongate. Crown for the most part crescent-shaped. Elytra much longer than the abdomen; apical areas four, the second triangular; appendix wanting. Submarginal wing-nerve incomplete; first and second wing-nerves simple, as well as the third, the two former connected near the apex by a short transverse nerve, the latter joined by a transverse nerve to the second nerve above and the submarginal nerve below.

TABLE OF SPECIES.

- |    |   |                          |
|----|---|--------------------------|
| 1  | (4). Elytra obliquely subtruncate at apex.  |                          |
| 2  | (3). Length, 3 mm. . . . .  | 1. <i>vittatus</i> .     |
| 3  | (2). Length, 2—2½ mm. . . . .   | 2. <i>notatus</i> .      |
| 4  | (1). Elytra evenly rounded at apex.   |                          |
| 5  | (24). Head across the eyes as wide or wider than the pronotum.  |                          |
| 6  | (7). Hind tibiæ black, widely pale at the base . .  | 3. <i>urticæ</i> .       |
| 7  | (6). Hind tibiæ entirely pale, or only black at the extreme apex.   |                          |
| 8  | (19). Elytra with a black spot on the costa, or the inner margin, or both.  |                          |
| 9  | (14). Nerve forming the upper boundary of the fourth apical area springing from the middle of the apex of the subcostal area.   |                          |
| 10 | (11). Length, 3½ mm. . . . .  | 4. <i>stachydearum</i> . |
| 11 | (10). Length, 3 mm.   |                          |
| 12 | (13). Crown with two black spots on the hind margin, confluent behind, and forming a V  | 5. <i>collinus</i> .     |
| 13 | (12). Hind margin of the crown with one black spot, which is generally small and roundish   | 6. <i>melissæ</i> .      |
| 14 | (9). Nerve forming the upper boundary of the fourth apical area springing from about the middle of the apex of the suprabrachial area, or continuous with the brachial nerve. |                          |
| 15 | (18). Pronotum with two large subreniform black spots.  |                          |
| 16 | (17). Length, 4 mm. Sides of the face longer than its width including the eyes . . . . .  | 7. <i>auratus</i> .      |

- 17 (16). Length,  $3\frac{1}{2}$  mm. Sides of the face shorter than its width including the eyes .. 8. *carpini*.  
 18 (15). Pronotum unspotted, or, if spotted, the spots small and not subreniform .. .. 9. *signatipennis*.  
 19 (8). Elytra without black spots on the costa or inner margin.  
 20 (21). Elytra with alternate pale and fuscous stripes 10. *tenellus*.  
 21 (20). Elytra not striped.  
 22 (23). Elytra pale green, generally infuscated down the middle .. .. 11. *abrotani*.  
 23 (22). Elytra yellow, more or less tinged with fuscous at the apex .. .. 12. *filicum*.  
 24 (5). Head across the eyes narrower than the pronotum.  
 25 (26). Elytra without markings .. .. 13. *Germari*.  
 26 (25). Elytra with a fine oblique black line about the middle of the costa.  
 27 (28). A deep black round spot on the membrane.. 14. *pulchellus*.  
 28 (27). Membrane without any round black spot .. 15. *concinna*.

### 1. *Eupteryx vittatus*, Lin.

*Cicada vittata*, Lin., Faun. Suec., ed. i., 634; ed. ii., 242, 893; Sys. Nat., v., 463, 36; Fall. Hem. Suec., ii., 56, 53.

*Cicadula vittata*, Zett., Ins. Lap., 299, 17.

*Typhlocyba vittata*, H.-Scff., Deuts. Ins., 164, 16; Burm., Handb., ii., 107, 3; Flor. Rhyn. Liv., ii., 426, 30; Kirschb., Cicad., 193, 36; Leth., Cat. Hem. Nord., ed. ii., 70; Fieb., Cicad. d'Eur. (*Typhlocybini*), 29, 1.

*T. 4-signata*, Hardy, Trans. Tynes. F. C., i., 418, 5.

*Eupteryx vittatus*, Marsh., Ent. Mo. Mag., iii., 267, 25; J. Sahl., Not. Fenn., xii., 190, 1.

Head yellow; hind part of crown blackish brown, with a pale middle stripe. Pronotum blackish brown, sometimes with a few (3 to 5) pale points. Scutellum blackish brown, a fine middle stripe and the apex yellow. Corium blackish brown, a large irregular patch on the costa reaching half-way across the elytron, a subtriangular spot in the apex of the costal area, and a semi-circular spot on the inner margin just below the apex of the scutellum, yellow; membrane blackish brown, a roundish spot in the base of the fourth apical area, two spots in the third apical area, a minute point in the base of the second apical area, a large roundish spot occupying almost the whole of the first apical area, and the apex narrowly shining white; on the apex of the nerve

dividing the first apical area from the second a small roundish yellow spot. Abdomen in the male black, hind margins of the segments yellow, genital plates yellow; in the female, above black with yellow hind margins to the segments, beneath yellow, pygofer black. Breast and legs yellow. Length, 3 mm.

Very common amongst low plants in damp places.

## 2. *Eupteryx notata*, Curt.

- Eupteryx notata*, Curt., Brit. Ent., xiv., 640, 1.  
*E. Wallengreni*, J. Sahl., Not. Fenn., xii., 191, 2.  
*E. diminuta*, Ferrari, Cicad. agri Ligust., 78.  
*Typhlocyba Wallengreni*, Stal, Ofv., 177, 7 (1854);  
 Fieb., Cicad. d'Eur. (*Typhlocybini*), 31, 3.  
*T. diminuta*, Kirschb., Cicad., 191, 17; Leth., Cat.  
 Hem. Nord., ed. ii., 70.

Like the preceding species in colour and facies, but one-third smaller, with the crown more pointed. Length, 2—2½ mm.

Common amongst low plants in waste places.

## 3. *Eupteryx urticae*, Fab.

- Cicada urticae*, Fab., Sys. Rhyn. 77, 76; Fall., Hem. Suec., ii., 50, 41.  
*Cicadula urticae*, Zett., Ins. Lap., 299, 16.  
*Typhlocyba urticae*, H.-Seff., Deuts. Ins., 124, 4; Flor, Rhyn. Liv., ii., 428, 31; Kirschb., Cicad., 195, 38; Leth., Cat. Hem. Nord., ed. ii., 71; Fieb., Cicad. d'Eur. (*Typhlocybini*), 41, 12.  
*Eupteryx tarsalis*, Curt., Brit. Ent., xiv., 640, 6.  
*E. urticae*, Marsh., Ent. Mo. Mag., iii., 268, 26; J. Sahl., Not. Fenn., xii., 193, 4; Ferrari, Cicad. agri Ligust., 79.

Frons yellow, sides and apex frequently black, just below the forehead a pair of black points. Crown yellow, a triangular spot on the hind margin and two roundish spots on the disc black. Pronotum yellow, with a black spot on each side and about four others on the front margin, on the hinder half a double fuscous middle stripe bounded on each side by a black triangular spot. Scutellum yellow, with two black spots at the base. Elytra greenish white; clavus with two streaks at the base, a suboval spot in the middle, and the apex, fuscous; brachial area fuscous; supra-brachial area apparently divided into two, of which the basal

one is filled up with fuscous and the other is margined with the same colour, more widely at the base and apex; the apical half of the subcostal area is also margined with fuscous in a similar manner; on the costa two oblique black spots, one before, the other which reaches the suprabrachial area, just behind the middle. Membrane dark fuscous, a spot at the base of the fourth apical area, an irregular interrupted band across the middle, the apex rather widely, and a small roundish spot on the apex of the nerve dividing the first apical area from the second, white. Breast and abdomen black; hind margins of the segments of the latter narrowly yellow. Legs yellow; hind tibiæ black, except at the base; apex of the hind tarsi black in the male. Length,  $3\frac{1}{4}$ — $3\frac{1}{2}$  mm.

Very common amongst nettles.

4. *Eupteryx stachydearum*, Hardy.

*Typhlocyba stachydearum*, Hardy, Trans. Tynes. F. C., i., 422, 9.

*T. Curtisii*, Flor, Rhyn. Liv., ii., 431, 32; Leth., Cat. Hem. Nord., ed. ii., 72; Fieb., Cicad. d'Eur. (*Typhlocybini*), 44, 13.

*T. Zelleri*, Kirschb., Cicad., 195, 40.

*Eupteryx stachydearum*, Marsh., Ent. Mo. Mag., iii., 268, 28.

*E. hortensis*, Curt., Brit. Ent., xiv., 640, 5 (forte).

Head, pronotum, and scutellum yellow, with dark markings as in *E. urticæ*, save that the spot on the back of the crown is generally transversely suboval and somewhat irregular in outline, and the double stripe on the hind part of the pronotum is more or less suffused over the disc. Elytra greenish white, the areas a little darker and narrowly margined with fuscous, the costal spot nearest the base obsolete, and the one beyond the middle divided by the pale nerve, which separates the costal area from the subcostal. Membrane dark fuscous, a spot in the fourth apical area, a bisinuate band across the middle, the apex very narrowly, and a large roundish spot on the first apical area, white. Breast and abdomen black, hind margins of the segments of the latter yellow. Legs yellow: ♂; hind tibiæ narrowly black at the apex, some fuscous spines as well as pale ones on the outer side, first joint of hind tarsi black, pale on the basal third or a little more, third joint fuscous at the extreme apex; ♀ generally with the extreme apex of the hind tibiæ and tarsi fuscous, but very frequently the basal joint of the hind tarsi is fuscous at the apex. Length,  $3\frac{1}{2}$  mm.

Very common on Labiates, particularly on *Teucrium scorodonia*. Easily distinguished from the two following species by its larger size and darker colour. The two points on the frons are not unfrequently wanting in the male.

5. *Eupteryx collinus*, Flor.

*Typhlocyba collina*, Flor, Rhyn. Liv., ii., 433, 33; Kirschb., Cicad., 196, 42; Leth., Cat. Hem. Nord., ed. ii., 72; Fieb., Cicad. d'Eur. (*Typhlocybini*), 45.

Similar to the preceding, but smaller and paler, and having the basal black spot on the crown always V-shaped. Legs yellow: ♂; hind tibiæ narrowly black at the apex, with some of the spines on the outer side fuscous, first joint of the hind tarsi black on the apical third or a little less, third joint black, pale at the base: ♀; hind tarsi dark only at the extreme apex, outer edge of hind tibiæ without fuscous spines. Length, 3 mm.

Locally abundant on *Ballota nigra* at Norwich.

6. *Eupteryx melissæ*, Curt.

*Eupteryx melissæ*, Curt., Brit. Ent., xiv., 640, 7; Marsh., Ent. Mo. Mag., iii., 268, 27; Ferrari, Cicad. agri Ligust., 79.

*Typhlocyba melissæ*, Leth., Cat. Hem. Nord., ed. ii., 72 and 84; Fieb., Cicad. d'Eur. (*Typhlocybini*), 44.

Very similar to the last in size and appearance, but the basal black spot on the crown is never V-shaped. Legs yellow, only the extreme apex of the tarsi fuscous. Very rarely in the male the hind legs are coloured as in that sex of *E. collinus*, but there are no fuscous spines on the outer edge of the hind tibiæ in either sex. Length, 3 mm.

On various Labiates; not uncommon.

7. *Eupteryx auratus*, Lin.

*Cicada aurata*, Lin., Faun. Suec., ed. i., 635; ed. ii., 243, 899; Sys. Nat., 466, 48; Fab., Sys. Rhyn., 78, 80; Fall., Hem. Suec., ii., 50, 40.

*Typhlocyba aurata*, H.-Seff., Nom. Ent., 68; Flor, Rhyn. Liv., 423, 28; Kirschb., Cicad., 192, 33; Leth., Cat. Hem. Nord., ed. ii., 71; Fieb., Cicad. d'Eur. (*Typhlocybini*), 54, 21.

*T. picta*, Burm., Handb., ii., 107, 2.

*T. fulva*, H.-Scff., Deuts. Ins., 143, 1.

*Eupteryx auratus*, Marsh., Ent. Mo. Mag., iii., 266, 23; J. Sahl., Not. Fenn., xii., 194, 5; Ferrari, Cicad. agri Ligust., 79.

Fore parts yellow or greenish yellow; sides and apex of the frons sometimes black; on the crown two large black spots, which are occasionally more or less confluent behind; on the pronotum a large sometimes subreniform black spot on each side, and often a pair of black points near the front margin; scutellum with two large black spots at the base, which sometimes leave only a fine middle stripe and the apex pale. Elytra yellow or greenish yellow, with a wide irregular fuscous stripe down the middle; on the costa near the base an oblique black line, and just beyond the middle a large black spot; on the middle of the inner margin a round black spot. Membrane fuscous, a large spot in the first, third, and fourth apical areas, a minute spot on the apex of the nerve dividing the first and second apical areas, and the apex broadly, white. Abdomen black; hind margins of the segments more or less narrowly yellow; genital plates yellow. Legs entirely yellow. Length, 4 mm.

Sparingly on mint at Norwich in company with *E. carpini*, *E. stachydearum*, and *E. melissæ*; probably widely distributed, but overlooked. Marshall (*l. c.*, 267) considered this species sufficiently common throughout the country, but it has scarcely been recognised with certainty since the time he wrote.

#### 8. *Eupteryx carpini*, Fourc.

*Cicada carpini*, Fourc., Ent. Par., i., 191, 25.

*C. picta*, Fab., Ent. Syst., iv., 42, 67; Sys. Rhyn., 71, 76.

*Tettigonia picta*, H.-Scff., Deuts. Ins., 112, 23.

*Typhlocyba picta*, id., *l. c.*, 169, 16; Flor, Rhyn. Liv., ii., 427, 29; Kirschb., Cicad., 193, 34.

*T. aureola*, Boh., Sv. Ak. Handl., 49, 23 (1847).

*T. carpini*, Leth., Cat. Hem. Nord., ed. ii., 77; Fieb., Cicad. d'Eur. (*Typhlocybini*), 53, 20.

*Eupteryx pictus*, Marsh., Ent. Mo. Mag., iii., 267, 24; J. Sahl., Not. Fenn., xii., 195, 6.

*E. carpini*, Ferrari, Cicad. agri Ligust., 79.

Similar to the preceding, but smaller, with all the dark markings much reduced. The fuscous stripe down the elytra is very

frequently more or less interrupted on the disc, when the dark markings consequently take the form of two irregular curved bands, one before and the other behind the middle; this band-like arrangement of the markings is best appreciated when the elytra are closed. Genital plates black, the outer sides and apices broadly yellow. Length,  $3\frac{1}{2}$  mm.

Very abundant on various low plants, and especially Labiates, in gardens and elsewhere in autumn.

9. *Eupteryx signatipennis*, Boh.

*Typhlocyba signatipennis*, Boh., Sv. Ak. Handl., 36, 8 (1849).

*Eupteryx signatipennis*, Marsh., Ent. Mo. Mag., iii., 247, 15; J. Sahl., Not. Fenn., xii., 196, 7; Fieb., Cicad. d'Eur. (*Typhlocybini*), 55.

Face yellow; upper fore parts very pale green, sometimes with a pair of black triangles on the base of the scutellum, and more rarely a black point on each side of the pronotum with or without some indication of a pair of spots on the crown. Elytra very pale green, the brachial area and the apical half of the suprabrachial and subcostal areas whitish hyaline, near the costa beyond the middle a small black spot and a round black spot on the inner margin about the middle, the disc occasionally with some ill-defined fuscous stripes; rarely the elytra are without spots. Membrane whitish hyaline, more or less suffused with fuscous and frequently having an ill-defined blackish spot near the apex of the first apical area. Abdomen black; hind margins of the segments very narrowly pale. Legs entirely pale yellow. Length,  $3\frac{1}{2}$  mm.

On *Spiræa ulmaria*; local.

10. *Eupteryx tenellus*, Fall.

*Cicada tenella*, Fall., Act. Holm., 43 (1806); Hem. Succ. ii., 52, 44.

*Typhlocyba tenella*, H.-Scff., Deuts. Ins., 164, 16; Flor, Rhyn. Liv., ii., 421, 27; Kirschb., Cicad., 191, 32; Fieb., Cicad. d'Eur. (*Typhlocybini*), 49, 17.

*T. pulchella*, H.-Scff., l. c., 124, 6.

*Eupteryx tenella*, J. Sahl., Not. Fenn., xii., 192, 3; Doug., Ent. Mo. Mag., xii., 204.

Head yellow, sides and apex of the frons frequently black, two large round spots on the forehead, and a transversely suboval one

on the base of the crown, black. Pronotum fuscous, broadly yellow in front. Scutellum yellow, with a large black spot on each side of the base. Elytra pale green, the suprabrachial area and the membrane fusco-hyaline; a stripe in the subcostal area, a rather wide regular one along the claval suture, and the scutellar margin narrowly, dark fuscous. Abdomen black, margins of the segments more or less widely yellow. Legs yellow; the extreme apex of the tarsi fuscous. Length, 3 mm.

Scarce. Birdbrook, Essex (*Power*); on *Achillea millefolium* near Norwich.

### 11. *Eupteryx abrotani*, Dougl.

*Eupteryx abrotani*, Dougl., Ent. Mo. Mag., xi., 118; Fieb., Cicad. d'Eur. (*Typhlocybini*), 56.

Face yellow; upper fore parts pale green without markings. Elytra pale greenish yellow, the nerves of the disc generally margined with fuscous; membrane whitish hyaline, the pale green nerves very broadly margined with fuscous. Abdomen black; hind margins of the segments sometimes very narrowly yellow. Legs yellow, claws fuscous. Length, 3 mm.

On *Artemisia abrotanum* and *maritima*; abundant where it occurs.

### 12. *Eupteryx filicum*, Newm.

*Typhlocyba filicum*, Newm., Trans. Ent. Soc. Lond., 2nd ser., ii., Proceed., 132, 3; Leth., Cat. Hem. Nord., ed. ii., 73; Fieb., Cicad. d'Eur. (*Typhlocybini*), 34, 6.

*Eupteryx filicum*, Marsh., Ent. Mo. Mag., iii., 247, 16.

Fore parts yellow; pronotum sometimes tinged with red in the male. Elytra yellow or golden yellow, a spot in the apex of the brachial, suprabrachial, and subcostal areas, and the membrane, fuscous; the latter with about three large whitish hyaline spots. Abdomen black; hind margins of the segments more or less widely yellow. Legs yellow, sometimes tinged with red. Length, 3½ mm.

On ferns; local and scarce. London (*Douglas*), Milford (*Marshall*).

13. *Eupteryx Germari*, Zett.

*Cicadula Germari*, Zett., Ins. Lap., 301, 23.

*Typhlocyba Germari*, H.-Seff., Deuts. Ins., 164, 16;  
Flor, Rhyn. Liv., ii., 420, 26; Kirschb., Cicad.,  
189, 28; Leth., Cat. Hem. Nord., ed. ii., 72;  
Fieb., Cicad. d'Eur. (*Typhlocybini*), 33, 5.

*Eupteryx Germari*, Marsh., Ent. Mo. Mag., iii., 266,  
22; J. Sahl., Not. Fenn., xii., 213, 11.

Upper side greenish grey; membrane whitish hyaline, fumose round the apex. Elytra subopaque, suprabrachial area and the apical half of the subcostal area whitish hyaline. Nerves of the membrane fuscous from the apex forwards. Wings fumose, longitudinal nerves black. Abdomen black; hind margins of the segments more or less narrowly yellow. Legs greenish grey. Length, 4—4½ mm.

On Scotch firs; not uncommon.

14. *Eupteryx pulchellus*, Fall.

*Cicada pulchella*, Fall., Hem. Suec., ii., 55, 51.

*Cicadula pulchella*, Zett., Ins. Lap., 301, 22.

*Typhlocyba pulchella*, Flor, Rhyn. Liv., ii., 418, 25;  
Kirschb., Cicad., 190, 30; Leth., Cat. Hem.  
Nord., ed. ii., 70; Fieb., Cicad. d'Eur. (*Typhlo-*  
*cybini*), 36, 8.

*Eupteryx pulchellus*, Marsh., Ent. Mo. Mag., iii., 266,  
21; J. Sahl., Not. Fenn., ii., 199, 10.

*E. ornatipennis*, Curt., Brit. Ent., xiv., pl. 640.

Crown, pronotum, and scutellum yellow, the two latter frequently suffused with brown. Elytra lighter or darker yellow, more or less suffused with brown towards the apex of the corium, sometimes with a rosy tinge; an oblique line on the middle of the costa reaching outwardly to the subcostal area, the nerve at the apex of the costal area, and a conspicuous point on the nerve which separates the first from the second apical area, black. Membrane fuscous, the apex very narrowly, a spot at the base of the first apical area, and another in the third apical area, white; the nerve at the apex of the brachial area fuscous, and the space around it suffused with the same colour. Abdomen black above; hind margins of the segments more or less widely pale. Legs pale yellow. Length, 4—4½ mm.

Common, especially on oaks. Pale whitish examples

of this insect are not uncommon, but they may always be distinguished from the next species by the minute but constant differences in the pattern on the elytra.

15. *Eupteryx concinna*, Germ.

*Tettigonia concinna*, Germ., Faun. Ins. Eur., 14, 22.

*Typhlocyba concinna*, H.-Scff., Deuts. Ins., 164, 16 ;  
Leth., Cat. Hem. Nord., ed. ii., 70 ; Fieb., Cicad.  
d'Eur. (*Typhlocybini*), 35, 7.

*Eupteryx concinna*, Ferrari, Cicad. agri Ligust., 78  
and 79.

Exceedingly like a pale whitish example of the last species, but although there is sometimes the faintest possible indication of the black spot on the nerve which divides the first from the second apical area, it is never developed, and in place of the ill-defined brown line which bounds the apex of the brachial area in *E. pulchellus* the apices of both the brachial and suprabrachial areas in the present species are bounded by a sharply-defined black line. Length, 4—4½ mm.

Not uncommon on oaks ; occurring with the last species. The distinctive characters given above are supplemented by great structural differences between the male genitalia of this species and *E. pulchellus*.

vi. TYPHLOCYBA, *Germ.* (Pl. III., fig. 23).

Germar, Silb. Rev. Ent., i. (1833).

Body small, cylindrical. Crown crescent-shaped, more or less pointed. Elytra much longer than the abdomen, the four apical areas well-defined, the second triangular ; membrane wanting. Submarginal wing-nerve incomplete ; first and second wing-nerves confluent before the apex and running to the margin as one nerve ; third wing-nerve simple, the straight transverse nerve connecting it with the second wing-nerve, prolonged in a suboblique direction as far as the submarginal nerve.

This genus, as here limited, is equivalent to *Anomia*, Fieb. (Cicad. d'Eur., pt. i., 128). The species are mostly arboreal in their habits.

## TABLE OF SPECIES.

- |    |       |  |                         |
|----|-------|--|-------------------------|
| 1  | (8).  | Pronotum with one or more black spots.   |                         |
| 2  | (5).  | Two or more black spots on the pronotum.   |                         |
| 3  | (4).  | Disc of pronotum with an oval black spot down the middle .. .. .   | 1. <i>jucunda</i> .     |
| 4  | (3).  | Disc of pronotum without any black marking in the middle .. .. .   | 2. <i>sexpunctata</i> . |
| 5  | (2).  | Pronotum with only one (punctiform) black spot.  |                         |
| 6  | (7).  | Nerves of the membrane not black at the apex   | 3. <i>debilis</i> .     |
| 7  | (6).  | Nerves of the membrane black at the apex ..  | 4. <i>ulmi</i> .        |
| 8  | (1).  | Pronotum not spotted with black.   |                         |
| 9  | (26). | Elytra not striped or banded with dark brown.  |                         |
| 10 | (25). | Elytra yellow, greenish yellow, or creamy white.   |                         |
| 11 | (20). | Elytra yellow, membrane distinctly fuscous.  |                         |
| 12 | (17). | Suture not fuscous.  |                         |
| 13 | (14). | Nerves of the membrane black at the apex ..  | 5. <i>tenerrima</i> .   |
| 14 | (13). | Nerves of the membrane not black at the apex.  |                         |
| 15 | (16). | Abdomen chiefly black .. .. .  | 6. <i>aurovittata</i> . |
| 16 | (15). | Abdomen pale .. .. .   | 7. <i>Douglasi</i> .    |
| 17 | (12). | Suture more or less broadly fuscous.   |                         |
| 18 | (19). | Entire clavus more or less distinctly fuscous  | 8. <i>gratiosa</i> .    |
| 19 | (18). | Suture narrowly fuscous .. .. .  | 9. <i>cratagi</i> .     |
| 20 | (11). | Elytra yellow or creamy white, membrane not or only very faintly tinged with fuscous.  |                         |
| 21 | (22). | ♂; elytra deep yellow, costa narrowly reddish: ♀; elytra pale yellow, apical areas hyaline .. .. .   | 10. <i>Lethierryi</i> . |
| 22 | (21). | Not as above.  |                         |
| 23 | (24). | Elytra varying in colour from pale yellow to milk-white, apical areas faintly tinged with fuscous. Penis with a tuft of four lanceolate leaf-like appendages at the apex. Lives on roses .. .. . | 11. <i>rosæ</i> .       |
| 24 | (23). | Elytra very pale creamy white, scutellum tinged with pink, at least when fresh. Penis with a tuft of four falcate appendages at the apex. Lives on willows .. .. .                               | 12. <i>salicicola</i> . |
| 25 | (10). | Elytra whitish, with large red spots .. .. .   | 13. <i>quercus</i> .    |
| 26 | (9).  | Elytra striped or banded with dark brown.  |                         |
| 27 | (28). | Elytra yellow, with two broad dark brown bands .. .. .   | 14. <i>nitidula</i> .   |
| 28 | (27). | Elytra yellow, with a narrow dark brown stripe along the claval suture .. .. .   | 15. <i>geometrica</i> . |

1. *Typhlocyba jucunda*, H.-S.

*Typhlocyba jucunda*. H.-Seff., Deuts. Ins., 144, 16; Flor, Rhyn. Liv., ii., 632; Kirschb., Cicad., 188, 27; J. Sahl., Not. Fenn., xii., 172, 1; Ferrari, Cicad. agri Ligust., 82; Fieb., Cicad. d'Eur. (*Typhlocybini*), 48, 16.

*T. Zetterstedti*, Boh., Sv. Ak. Handl., 47, 22 (1847).

*Eupteryx jucundus*, Marsh., Ent. Mo. Mag., iii., 265, 19.

Upper side yellow or greenish yellow, with black spots; elytra with fuscous stripes. Crown with two roundish black spots in front. Pronotum with an oval spot down the middle, a large round spot on each side, a point near each hind angle, and two others on the front margin black. Scutellum black, with two V-shaped lines across the base and the apex yellow. Elytra with two stripes in the clavus, a cuneate spot in the apex of the brachial area, the entire suprabrachial area, a stripe in the apical half of the subcostal area, and the membrane, fuscous; nerves of the latter yellow. Wings fumose, principal nerves black. Abdomen black; hind margins of the segments very narrowly yellow. Legs yellow, claws black. Length, 4 mm.

On alders; not uncommon.

2. *Typhlocyba sexpunctata*, Fall.

*Cicada 6-punctata*, Fall., Hem. Suec., ii., 51, 43.

*C. 10-punctata*, Fall., Act. Holm., 41, 46 (1806); Hem. Suec., ii., 51, 42.

*Cicadula 10-punctata*, Zett., Ins. Lap., 300, 21.

*Typhlocyba 6-punctata*, H.-Seff., Deuts. Ins., 143, 2, and 164, 16; Ferrari, Cicad. agri Ligust., 82.

*T. 10-punctata*, Flor, Rhyn. Liv., ii., 409, 20; Kirschb., Cicad., 188, 26; J. Sahl., Not. Fenn., xii., 173, 2.

*Eupteryx 10-punctatus*, Marsh., Ent. Mo. Mag., iii., 248, 17.

*Anomia 6-punctata*, Leth., Cat. Hem. Nord., ed. ii., 74.

*A. 10-punctata*, Fieb., Cicad. d'Eur. (*Typhlocybini*), 58, 2.

Upper side very pale greenish yellow or rosy, with small black spots; elytra with fuscous markings, which form two irregular curved bands. Frons fuscous in the male, generally yellow in the female; forehead in both sexes with two small roundish black spots. Pronotum with a roundish black spot on each side behind,

and two or four others near the front margin. Scutellum with a black triangle on each side at the base, their apices often confluent. Elytra with an ill-defined oblique half-band running backwards from the costa near the base, another ill-defined oblique half-band running forwards from the apex of the clavus, and a spot on the base of the clavus next its suture, fuscous; on the middle of the inner margin of the clavus a roundish black spot. Membrane hyaline, with a fuscous tinge, except in the fourth apical area; nerve at the apex of the costal area black, its immediate neighbourhood dark fuscous; nerves bounding the second and third apical areas blackish from the apex forward. Abdomen black; hind margin of the segments yellow. Legs yellow; hind tibiae sometimes fuscous on the apical half in the male. Length,  $3\frac{1}{2}$  mm.

Not uncommon on sallows in autumn.

### 3. *Typhlocyba debilis*, Dougl.

*Typhlocyba debilis*, Douglas, Ent. Mo. Mag., xii., 204;  
Lethierry, Fieb., Cicad. d'Eur. (*Typhlocybini*), 67.

♀. Upper side yellowish white, elytra tinged with yellow on the inner half, a spot in the apex of each of the areas of the corium and the membrane entirely fuscous; nerves of the latter pale. Two points on the forehead, one in the middle of the front margin of the pronotum and one on the apex of the scutellum, black. Abdomen black; hind margins of the segments narrowly white. Legs yellowish white, claws fuscous. Length, 3 mm.

Rare. Darenth, on oak; Addington Hills, on beech and blackthorn growing amongst other bushes; Norwich, on beech. In France it is said to occur on apple-trees. The male is undescribed.

### 4. *Typhlocyba ulmi*, Linn.

*Cicada ulmi*, Linn., Faun. Suec., 644; id., ed. ii., 243, 900; Sys. Nat., 467, 49; Fab., Sys. Rhyn., 78, 81; Fall., Hem. Suec., ii., 49, 39.

*Typhlocyba ulmi*, Flor, Rhyn. Liv., ii., 411, 21;  
Kirschb., Cicad., 186, 23; J. Sahl., Not. Fenn., xii., 176, 4.

*Eupteryx ocellata*, Curt., Brit. Ent., xiv., 640, 8.

*E. ulmi*, Marsh., Ent. Mo. Mag., iii., 248, 18.

*Anomia ulmi*, Leth., Cat. Hem. Nord., ed. ii., 74;  
Fieb., Cicad. d'Eur. (*Typhlocybini*), 63, 8.

Upper side greenish yellow; forehead with a pair of black points in the female only; a minute black point in the middle of the front margin of the pronotum in both sexes; scutellum frequently black or blackish in the male. Elytra with a fuscous band across the apex of the corium; membrane faintly fumose, darker round the edge, its nerves black for a short distance forward from the apex. Abdomen black; hind margins of the segments narrowly yellow. Legs yellow, claws fuscous. Length,  $3\frac{3}{4}$ —4 mm.

Very abundant on elms.

### 5. *Typhlocyba tenerrima*, H.-S.

*Typhlocyba tenerrima*, H.-Seff., Deuts. Ins., 124, 10 a, and 164, 16; Kirschb., Cicad., 185, 19; J. Sahl., Not. Fenn., xii., 178, 6; Dougl., Ent. Mo. Mag., xii., 28, 5; Ferrari, Cicad. agri Ligust., 82.

*T. rubi*, Hardy, Trans. Tynes. F. C., i., 417, 3.

*T. misella*, Boh., Sv. Ak. Handl., 122 (1853).

*Anomia tenerrima*, Leth., Cat. Hem. Nord., ed. ii., 74; Fieb., Cicad. d'Eur. (*Typhlocybini*), 65, 11.

Fore parts and legs yellowish white. Elytra whitish hyaline, with three broad yellow stripes, one along the costa, one just above the claval suture, and the other on the inner margin of the clavus; an ill-defined broad fuscous band, on which the whitish nerves are conspicuous, crosses the apex of the corium and the base of the membrane; the latter faintly fumose, darker round the edge, its nerves black for a very short distance forward from the apex. Abdomen black; hind margins of the segments narrowly yellow. Claws fuscous. Length, 3 mm.

Common on brambles. One or more of the yellow stripes on the elytra are sometimes wanting.

### 6. *Typhlocyba aurovittata*, Dougl.

*Typhlocyba aurovittata*, Dougl., Ent. Mo. Mag., xii., 76, 6.

Head yellow or whitish yellow. Pronotum white, with a broad yellow stripe on each side of the disc. Scutellum yellow, sometimes with two reddish triangles on the base. Elytra yellow, with two rather broad whitish hyaline stripes, one along the costa and the other along the claval suture; a subquadrate spot in the apex of the brachial area and the membrane fuscous; nerves of the latter entirely pale. Abdomen black; hind margins of the

segments narrowly whitish. Legs pale yellow, claws fuscous. Length,  $3\frac{1}{2}$  mm.

Sparingly on oak bushes in hedges in November.

#### 7. *Typhlocyba Douglasi*, Edw.

*Typhlocyba Douglasi*, Edw., Ent. Mo. Mag., xiv., 248, fig. 1 (style); *op. cit.*, xviii., 224, fig. c (penis); Lethierry, Fieb., Cicad. d'Eur. (*Typhlocybini*), 67.

Head, pronotum, and scutellum pale yellow; elytra deep yellow, inclining to orange in the male, pale yellow or whitish in the female; a subcuneate spot in the apex of the brachial, supra-brachial, and subcostal areas, and the membrane, fuscous. Abdomen entirely yellow. Legs pale yellow, claws fuscous. Length,  $3\frac{1}{2}$  mm.

On beech; common.

#### 8. *Typhlocyba gratiosa*, Boh.

*Typhlocyba gratiosa*, Boh., Sv. Ak. Handl., 121 (1853); J. Sahl., Not. Fenn., xii., 179, 8; Dougl., Ent. Mo. Mag., xii., 76, 9.

*T. suturalis*, Flor., Rhyn. Liv., ii., 634; Kirschb., Cicad., 186, 22.

*Eupteryx apicalis*, var., Marsh., Ent. Mo. Mag. iii., 220, 7, sec. spec. comm.

*Anomia gratiosa*, Leth., Cat. Hem. Nord., ed. ii., 73.

*A. suturalis*, Fieb., Cicad. d'Eur. (*Typhlocybini*), 61, 7.

♂. Head, pronotum, and scutellum yellowish white. Elytra yellow, a streak in the apex of the subcostal, supra-brachial, and brachial areas, and the membrane, fuscous; clavus tinged with fuscous, especially on the claval suture and the inner margin. Abdomen and legs yellow, claws fuscous. ♀ yellowish white; the entire clavus, a streak in the apex of the subcostal, supra-brachial, and brachial areas, and the membrane, fuscous. Claws fuscous. Length,  $3\frac{1}{2}$  mm.

On beech; not very common. The male very rarely has the clavus so dark as the female.

#### 9. *Typhlocyba cratægi*, Dougl.

*Typhlocyba cratægi*, Dougl., Ent. Mo. Mag., xii., 203.

Pale yellow; the membrane, a small spot in the apex of the subcostal and supra-brachial areas, and the inner margin of the

elytra narrowly and evenly, fuscous. Costa narrowly reddish in the male. Abdomen entirely yellow. Legs pale yellow, claws fuscous. Length, 3 mm.

On whitethorn; not very common. Lethierry's description (Fieber's Cicad. d'Eur. (*Typhlocybini*) p. 67) is not very characteristic of this species.

#### 10. *Typhlocyba Lethierryi*, Edw.

*Typhlocyba Lethierryi*, Edw., Ent. Mo. Mag., xvii., 224, fig. a (penis).

*T. sulphurella*, Ferrari, Cicad. agri Ligust., 83.

*Anomia sulfurella*, Leth., Cat. Hem. Nord., ed. ii., 75; Fieb., Cicad. d'Eur. (*Typhlocybini*), 60, 5.

♂. Deep yellow inclining to orange. Elytra with the costa generally and the inner margin sometimes narrowly reddish; membrane and generally a spot in the apex of the subcostal, suprabrachial, and brachial areas pale fusco-hyaline. Hind tibiae generally tinged with pink. Claws fuscous. Penis divided at the apex into three branches, of which the hinder one is trifid, and the other two, which spring from a short common stem, are bifid. ♀ pale yellow. Membrane and three spots on the apex of the corium pale fusco-hyaline. Length, 3½ mm.

Occurs on various trees: maple, hornbeam, black poplar, elm, and lime. This species, although sufficiently distinct from its allies in the structure of the male genitalia, is not always easy to identify without a reference to those organs. The head and pronotum in highly-coloured males are yellow, sometimes tinged or marked with red; but less highly-coloured examples of that sex have the head and pronotum white, and the elytra nearly resembling those of male *Douglasi*, from which they may be distinguished by the paler membrane. The female is always much stouter and yellower than female *rosæ*, and has not the fuscous membrane which distinguishes that sex of *Douglasi*.

#### 11. *Typhlocyba rosæ*, Linn.

*Cicada rosæ*, Linn., Faun. Suec., ed. i., 645; ed. ii., 344, 902; Sys. Nat., 467, 50.

*Cicadula rosæ*, Zett., Ins. Lap., 300, 14.

*Typhlocyba pteridis*, Dahlb., Sv. Ak. Handl., 179 (1851).

*T. rosæ*, Flor, Rhyn. Liv., ii., 407, 17; Kirschb., Cicad., 184, 17; J. Sahl., Not. Fenn., xii., 180, 9; Ferrari, Cicad. agri Ligust., 83.

*T. lactea*, Dougl., Ent. Mo. Mag., xii., 77, 10, sec. spec. comm.

*Eupteryx rosæ*, Marsh., Ent. Mo. Mag., iii., 246, 10.

*Anomia rosæ*, Leth., Cat. Hem. Nord., ed. ii., 74; Fieb., Cicad. d'Eur. (*Typhlocybini*), 60, 4.

Head and pronotum white. Scutellum yellowish white. Elytra very pale yellow, dull white more or less tinged with yellow from the suture outwards, or entirely dull white; a spot in the apex of the brachial, suprabrachial, and subcostal areas, and the membrane, very faintly tinged with fuscous. Abdomen entirely yellow. Legs pale yellow, claws fuscous. Length,  $3\frac{1}{2}$ — $3\frac{3}{4}$  mm.

Very common; lives on roses. I have figured the penis of this species in Ent. Mo. Mag., xvii., p. 224, fig. b.

## 12. *Typhlocyba salicicola*, Edw.

*Typhlocyba salicicola*, Edw., Ent. Mo. Mag., xxi., 230, p. 229, fig. 2 a (penis).

Somewhat larger and decidedly stouter than *T. rosæ*. Very pale yellowish white; scutellum tinged with pink, at least in fresh examples. Membrane very faintly fusco-hyaline. Length,  $3\frac{1}{2}$ — $4\frac{1}{2}$  mm.

On willows; common.

## 13. *Typhlocyba quercus*, Fab.

*Cicada quercus*, Fab., Ent. Syst., iv., 47, 88; Sys. Rhyn., 79, 89; Fall., Hem. Suec., ii., 56, 54.

*Typhlocyba fasciata*, Tollin, Stett. Ent. Zeit., xii., 73.

*T. quercus*, H.-Scff., Deuts. Ins., 164, 9 and 16; Flor, Rhyn. Liv., ii., 412, 22; Kirschb., Cicad., 187, 24; J. Sahl., Not. Fenn., xii., 175, 3.

*Eupteryx quercus*, Marsh., Ent. Mo. Mag., iii., 265, 20.

*Anomia quercus*, Leth., Cat. Hem. Nord., ed. ii., 74; Fieb., Cicad. d'Eur. (*Typhlocybini*), 64, 9.

Upper side white; a line just within the front margin of the crown, a semicircular line on the front and a roundish spot on the disc of the pronotum, a triangle on each side of the base of the scutellum, three large spots on the clavus, and two on the corium, orange-red; the apical half of the subcostal area, the angular

nerves, and those on the basal half of the membrane, margined with fuscous. On the costa near the middle a short oblique black line. Abdomen yellowish white, the basal segments more or less widely black. Length,  $3\frac{1}{2}$  mm.

Common on oaks.

14. *Typhlocyba nitidula*, Fab.

*Cicada nitidula*, Fab., Ent. Syst., iv., 48, 87; Sys. Rhyn., 79, 88.

*Typhlocyba bifasciata*, Boh., Ofv., 79, 39 (1853).

*T. nitidula*, H.-Scff., Deuts. Ins., 164, 10 and 16; Flor, Rhyn. Liv., ii., 407, 18; Kirschb., Cicad., 185, 20; J. Sahl., Not. Fenn., xii., 177, 5.

*Eupteryx nitidulus*, Marsh., Ent. Mo. Mag., iii., 247, 13.

*Anomia nitidula*, Leth., Cat. Hem. Nord., ed. ii., 73; Fieb., Cicad. d'Eur. (*Typhlocybini*), 59, 3.

*A. Norgueti*, Leth., l. c.

Pale yellow; the scutellum, a broad band across the base of the elytra, and another across the apex of the corium, blackish brown. Membrane whitish hyaline. Claws fuscous. Length,  $3\frac{1}{2}$ — $3\frac{2}{3}$  mm.

This species sometimes swarms on broad-leaved elms, but is very uncertain in its appearance; I once took it in quantity on Lombardy poplar. A variety of uncommon occurrence (*A. Norgueti*, Leth.) has the space between the two bands on the elytra filled up with blackish brown.

15. *Typhlocyba geometrica*, Schr.

*Cercopis geometrica*, Schrank, Faun. Boic., ii., 57, 1076.

*Tettigonia geometrica*, Germ., Faun. Ins. Eur., 12, 18.

*Cicada lineatella*, Fall., Hem. Suec., ii., 54, 50.

*Cicadula lineatella*, H.-Scff., Deuts. Ins., 143, 3, and 164, 16.

*Typhlocyba plagiata*, Hardy, Trans. Tynes. F. C., i., 416, 1.

*T. geometrica*, Flor, Rhyn. Liv., ii., 408, 19; Kirschb., Cicad., 186, 21; J. Sahl., Not. Fenn., xii., 178, 7.

*Eupteryx geometricus*, Marsh., Ent. Mo. Mag., iii., 247, 14.

*Anomia geometrica*, Leth., Cat. Hem. Nord., ed. ii., 73; Fieb., Cicad. d'Eur. (*Typhlocybini*), 61, 6.

Yellow; elytra with a narrow regular dark brown stripe along the claval suture. Scutellum with a dark brown stripe on each side, and the side margins of the apical half narrowly dark brown. Membrane fusco-hyaline, third and fourth apical areas fuscous. Claws fuscous. Length,  $3\frac{3}{4}$ —4 mm.

On alders; not very common.

vii. ZYGINA, *Fieb.* (Pl. III., fig. 24).

Fieber, *Cicad. d'Europe*, pt. i., 129 (1876).

Body generally very slender. Crown as in the preceding genus. Elytra much longer than the abdomen; first apical area very small, almost obsolete; the third oblong, parallel-sided; appendix wanting. Submarginal wing-nerve incomplete; first and second wing-nerves confluent before the apex, and running to the margin as one nerve; third wing-nerve simple, joined to the second by a straight transverse nerve, the nerve connecting it with the submarginal nerve very oblique.

TABLE OF SPECIES.

1	(2). Species bright yellow, without markings	..	1. <i>alneti</i> .
2	(1). Not as above.		
3	(8). Elytra marked with red.		
4	(7). Abdomen entirely pale, third apical area not more than half as wide as fourth.		
5	(6). Hind tarsi in the male black on the apical half only	.. .. .	2. <i>blandula</i> .
6	(5). Hind tarsi in the male entirely black	.. .. .	3. <i>tillæ</i> .
7	(4). Abdomen above black, sides yellow; third apical area about two-thirds as wide as fourth	.. .. .	4. <i>hyperici</i> .
8	(3). Elytra without red markings.		
9	(10). Crown with two round black spots, apex of scutellum pale	.. .. .	5. <i>parvula</i> .
10	(9). Crown without black spots, apex of scutellum black	.. .. .	6. <i>scutellaris</i> .

1. *Zygina alneti*, Dahlb.

*Cicadula alneti*, Dahlb., Sv. Ak. Handl., 181 (1851).

*Typhlocyba coryli*, Tollin, Stett. Ent. Zeit., xii., 70, 12; Flor, Rhyn. Liv., ii., 404, 15; Kirschb., Cicad., 184, 16.

*T. alneti*, J. Sahl., Not. Fenn., xii., 181, 10; Dougl., Ent. Mo. Mag. xii., 77, 12; Ferrari, Cicad. agri Ligust., 83.

*Zygina alneti*, Leth., Cat. Hem. Nord., ed. ii., 75 ;  
Fieb., Cicad. d'Eur. (*Typhlocybini*), 68, 1.

Fore parts and legs pale yellow. Elytra bright yellow. Claws fuscous. Length,  $3\frac{3}{4}$  mm.

On alders; not uncommon. Specimens from hazel have the fore parts yellowish white and the elytra very pale flavo-hyaline. These may possibly prove specifically distinct from the insect which lives on alders, but having no males of the hazel insect at hand I am unable to compare the genitalia.

### 2. *Zygina blandula*, Rossi.

*Cicada blandula*, Rossi, Faun. Etr., ii., 217, 1263 ;  
Fall., Hem. Suec., ii., 57, 56.

*Typhlocyba blandula*, H.-Scff., Deuts. Ins., 164, 16 ;  
Flor, Rhyn. Liv., ii., 400, 13 ; Kirschb., Cicad.,  
183, 15 ; J. Sahl., Not. Fenn., xii., 184, 13.

*T. quercus*, H.-Scff., Deuts. Ins., 124, 7.

*Eupteryx flammigera*, Curt., Brit. Ent., xiv., 640, 2.

*E. blandulus*, Marsh., Ent. Mo. Mag., iii., 246, 10.

*Zygina blandula*, Leth., Cat. Hem. Nord., ed. ii., 77 ;  
Fieb., Cicad. d'Eur. (*Typhlocybini*), 78, 11 ;  
Ferrari, Cicad. agri Ligust., 86.

Crown and pronotum whitish yellow, with a fuscous or carmine-red middle stripe, which gradually widens from the apex of the crown to the base of the pronotum, and is generally divided down the middle by a pale line. Elytra whitish hyaline, with a fuscous zigzag stripe more or less covered with carmine-red atoms, on the inner margin; second and fourth apical areas generally fumose. Abdomen pale yellow. Legs whitish; the entire third joint of the hind tarsi and the apex of the second black in the male. Length,  $2\frac{3}{4}$ —3 mm.

In mixed hedges, and on various low plants; very common in autumn. Occasionally the carmine-red atoms extend to the nerves of the corium, but they are sometimes almost entirely absent.

### 3. *Zygina tiliæ*.

*Cicada tiliæ*, Fall., Hem. Suec., ii., 57, 55.

*Zygina tiliæ*, Leth., Cat. Hem. Nord., ed. ii., 77 ; Fieb.,  
Cicad. d'Eur. (*Typhlocybini*), 78, 12 ; Ferrari,  
Cicad. agri Ligust., 86.

*Typhlocyba tiliæ*, Dougl., Ent. Mo. Mag., xii., 79 ;  
Edw., Ent. Mo. Mag.

Very similar to the preceding, but differs in the following particulars: the crown and pronotum are more decidedly yellow, and the stripe on them is almost obsolete, the carmine-red atoms on the elytra are much more sparingly distributed, and the hind tarsi of the male are black, except at the extreme base. Length, 3 mm.

I have never taken this species in summer or autumn, but have beaten it from ivy and spruce-fir in the spring in nearly equal numbers with *Z. blandula*.

#### 4. *Zygina hyperici*, H.-S.

*Typhlocyba hyperici*, H.-Scff., Deuts. Ins., 143, 4 ;  
Flor, Rhyn. Liv., ii., 398, 12 ; Kirschb., Cicad.,  
183, 14 ; J. Sahl., Not. Fenn., xii., 137, 15.

*T. coronula*, Boh., Sv. Ak. Handl., 44, 19 (1847).

*T. placidula*, Stal, Ofv., 176, 6 (1854).

*Eupteryx hyperici*, Marsh., Ent. Mo. Mag., iii., 220, 9.

*Zygina hyperici*, Leth., Cat. Hem. Nord., ed. ii., 75 ;  
Fieb., Cicad. d'Eur. (*Typhlocybini*), 70, 4.

Crown and pronotum whitish yellow, with a dark purple-brown middle stripe, which gradually widens from the apex of the crown to the hind margin of the pronotum. Scutellum purple-brown. Elytra very pale flavo-hyaline, the inner margin as far as the apex of the clavus with a broad blood-red stripe. Abdomen above black, sides yellow. Legs yellow. Length, 2½ mm.

Very rare. On *Hypericum perforatum* in woods as late as October. This species seems from descriptions to be just as variable in markings as the two preceding; pale varieties in which the only dark markings indicated are those on the pronotum and scutellum are not unfrequent, especially in the male. It is, however, well distinguished by its habitat and small size.

#### 5. *Zygina parvula*, Boh.

*Typhlocyba parvula*, Boh., Sv. Ak. Handl., 46, 21  
(1847) ; Flor, Rhyn. Liv., ii., 397, 11 ; Kirschb.,  
Cicad., 182, 12 ; J. Sahl., Not. Fenn., xii., 188, 16.

*T. 10-punctata*, H.-Scff., Deuts. Ins., 124, 5.

*Eupteryx parvulus*, Marsh., Ent. Mo. Mag., iii., 220, 8.

*Zygina parvula*, Leth., Cat. Hem. Nord., ed. ii., 75; Fieb., Cicad. d'Eur. (*Typhlocybini*), 73, 6; Ferrari, Cicad. agri Ligust., 85.

Head yellow, sides and apex of the frons and two round spots on the crown black. Pronotum fuscous, with three oblong oval yellow spots on the front margin; hind margin broadly whitish. Scutellum yellow, with a large black triangle on each side of the base. Elytra whitish hyaline, a broad stripe in the clavus and another in the brachial area fuscous; second and fourth apical areas fumose. Abdomen black; hind margins of the segments very narrowly whitish. Legs whitish, claws fuscous. Length, 3 mm.

Amongst rushes and long grass in damp places; not very common. A female taken in spring at the roots of ling had the stripes on the elytra rather strongly tinged with pink.

#### 6. *Zygina scutellaris*, H.-S.

*Typhlocyba scutellaris*, H.-Seff., Deuts. Ins., 164, 13; Flor, Rhyn. Liv., ii., 405, 16; J. Sahl., Not. Fenn., xii., 182, 11.

*T. pullula*, Boh., Sv. Ak. Handl., 45, 20 (1847).

*Eupteryx scutellaris*, Marsh., Ent. Mo. Mag., iii., 246, 11.

*Zygina pullula*, Leth., Cat. Hem. Nord., ed. ii., 75; Cicad. d'Eur. (*Typhlocybini*), 71, 5.

*Z. scutellaris*, Ferrari, Cicad. agri Ligust., 85.

Frons and forehead fuscous, the former with a broad yellow middle stripe on the lower half, and some traces of transverse yellow side-lines, the latter with a yellow crescent-shaped spot on each side; cheeks and temples yellow; clypeus dark fuscous or black, except at the extreme base; crown yellow. Pronotum greenish yellow in front, whitish behind; across the middle a fuscous band, which is much dilated in the middle towards the front margin. Scutellum greenish yellow, with a black triangle on each side of the base; apex narrowly black. Elytra whitish hyaline, the clavus, the costal area, and the basal half of the subcostal area tinged with greenish yellow; nerves greenish yellow. Abdomen black; hind margins of the segments very narrowly yellow. Legs greyish yellow, claws fuscous. Length, 3 mm.

Amongst fine grasses in autumn; rather local.

## EXPLANATION OF PLATE III.

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- FIG. 1. *Evacanthus*; wing.  
 2. *Graphocræus*; upper fore parts.  
 3. *Tettigonia*; wing.  
 4. *Eupelia*; upper fore parts.  
 5. *Strongylocephalus*; upper fore parts.  
 6. *Acocephalus*; upper fore parts.  
 7. *Platymetopius*; upper fore parts.  
 8. *Doratura*; *a*, apex of abdomen, ♀; *b*, upper fore parts.  
 9. *Paramesus*; upper fore parts.  
 10. *Glyptocephalus*; upper fore parts.  
 11. *Stictocoris*; face.  
 12. *Athysanus*; face.  
 13. *Deltocephalus*; upper fore parts.  
 14. *Limotettix*; upper fore parts.  
 15. *Thamnotettix*; upper fore parts.  
 16. *Alebra*; wing.  
 17. *Dicraneura similis*; ♂ genital plates, seen from behind.  
 18. *Gnathodus*; upper fore parts.  
 19. *Dicraneura*; wing.  
 20. *Kybos*; *a*, elytron; *b*, wing.  
 21. *Allygus*; upper fore parts.  
 22. *Chlorita*; *a*, elytron; *b*, wing.  
 23. *Typhlocyba*; wing.  
 24. *Zygina*; *a*, elytron; *b*, wing.  
 25. *Eupteryx*; wing.